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FINAL SUPPLEMENT TO THE FINAL ENVIRONMENTAL STATEMENT PROPOSED SALE OF FORT MOHAVE LANDS, NEVADA

PREPARED BY

DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
NEVADA STATE OFFICE
RENO, NEVADA

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DEPARTMENT OF THE INTERIOR

(INT FES 75-10)

FINAL SUPPLEMENT TO THE
FINAL ENVIRONMENTAL STATEMENT
PROPOSED
SALE OF FORT MOHAVE LANDS, NEVADA

Prepared by

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BUREAU OF LAND MANAGEMENT

NEVADA STATE OFFICE, RENO, NEVADA

Arnold E. Petty

Acting Director, Bureau of Land Management

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SUMMARY

(X) Final Supplement to Final Environmental Statement, Sale of Fort Mohave Lands to the State of Nevada, (INT FES 75-10)

Department of the Interior, Bureau of Land Management

1. Type of Action: (X) Administrative ( ) Legislative

2. Brief Description of Action: (Proposed) Transfer of the remaining 9,000 acres of public lands in Clark County, Nevada, to the State of Nevada under the Fort Mohave Act of April 22, 1960 (74 Stat. 74), as amended (77 Stat. 14), and the Contract of Sale between the United States and the State of Nevada. The land is adjacent to the Colorado River at the southern tip of the State of Nevada, 95 miles southeast of Las Vegas, Nevada.

3. Summary of Environmental Impacts and Adverse Environmental Effects: The potential impacts considered as adverse concern cultural resources, flood hazards, and social-economic conditions affecting the Fort Mojave Indian Tribe. No endangered or threatened species (plants or wildlife) were found in the area.

4. Alternatives Considered: Unchanged from those considered in the Final Environmental Statement.

5. List of entities which received copy of Supplement to the Final Environmental Statement: (See list in Consultation and Coordination Section of this Supplement, p. 17.)

6. Date Made Available to EPA and the Public:

Draft Statement: December 27, 1972
Final Statement: January 23, 1975 (INT FES 75-10)
Draft Supplement to Final Statement: March 11, 1977 (INT FES 77-9)
Final Supplement to Final Statement: AUG 15 1978

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DESCRIPTION OF THE PROPOSED ACTION

The Fort Mohave Act authorizes the Secretary of the Interior to convey certain lands to the State of Nevada. Pursuant to the Act a Contract of Sale was entered into between the United States and the State of Nevada in 1966. On March 28, 1972, this contract was amended in part to provide that the Department of the Interior would prepare an Environmental Statement on the remainder of the transfer area and the Secretary of the Interior would (1) "determine whether compelling environmental reasons require that part or all of the transfer area not be conveyed considering that it was the intent of Congress in the Act that the transfer area should be conveyed," and (2) "formulate, substantially relying on the information provided in the Environmental Statement, the final stipulations, conditions and restrictions to be imposed on the use of the transfer area by the Commission, its successors and assigns."

A Final Environmental Statement was published January 23, 1975.

In April 1975, the Bureau of Land Management (BLM) asked the Office of the Solicitor to resolve charges that the Final Environmental Statement was deficient. These charges were raised in comments received from the Environmental Defense Fund (EDF) on September 16, 1974, and from the Natural Resources Defense Council, Inc., on March 13, 1975. The Office of the Solicitor affirmed the need for additional studies concerning flood hazards, endangered or threatened species, and cultural resources. Following receipt of comments from the Fort Mojave Tribal Council dated July 11, 1977, the Department of the Interior determined that the potential social and economic impacts of the proposed action on the Fort Mojave Tribe should be studied.

TABLE 1
SUMMARY OF ACTIONS PERTAINING TO THE FORT MOHAVE LAND SALE
(SUBSEQUENT TO PUBLICATION OF THE FINAL ENVIRONMENTAL
STATEMENT, 1/23/75)

June 28, 1976	Amendment to Contract of Sale extending time for completion of the Environmental Statement, for determination by the Department of the Interior and for purchase by the State of Nevada.
, 1977	Further Amendment to Contract of Sale extending time periods for the actions described above.

TABLE 1 (Continued)

Reports

June 9, 1976	Endangered Species Act Compliance Report-Wildlife. (U. S. Bureau of Land Management)
July 7, 1976	Endangered Species Act Compliance Report-Vegetation. (U. S. Bureau of Land Management)
August 1976	The Fort Mohave Cultural Resources Inventory, An Archaeological/Historical Field Investigation in Southern Clark County. (Nevada Archaeological Survey, Southern Division, UNLV)
September 7, 1976	Flood Hazard Evaluation for the Fort Mohave Lands. (Corps of Engineers, Department of the Army)
November 1977	Social and Economic Conditions Relating to the Fort Mojave Indians. (U. S. Bureau of Land Management, Nevada State Office and Las Vegas District Office)
February 1978	The Fort Mohave Cultural Resource Inventory, An Archaeological/Historical Field Investigation in Southern Clark County, Nevada (Second Phase). (Archaeological Research Center, UNLV Museum of Natural History)

DESCRIPTION OF THE ENVIRONMENT WITHOUT THE PROPOSED ACTION

Vegetation: Endangered or Threatened Species

To determine the presence of endangered or threatened plant species in the Fort Mohave land sale area, the Bureau of Land Management (BLM) conducted a literature search, herbaria search, and an on-site survey in June 1976 (see Appendix A, p. A-1, Endangered Species Act Compliance Report: Vegetation). Only a limited number of plant species in the United States have officially been designated as endangered. No species has been officially listed as threatened. Notices published in the *Federal Register* of July 1, 1975 and June 16, 1976 proposed listing approximately 3,000 plant species as endangered or threatened. Out of those proposed for listing, 135 are reported to occur in Nevada. The field, literature, and herbaria investigations did not show any of these species occurring in the proposed sale area.

One species, *Ferocactus acanthodes*, whose protection is of concern to the Northern Nevada Native Plant Society, does occur within the sale area. This cactus does not appear in either of the *Federal Register* proposed listings because of its fairly widespread occurrence in other States. However, exploitation of cactus species in the Southwest is of concern to citizens interested in the protection of native flora.

Wildlife: Endangered or Threatened Species

An Endangered Species Act Compliance Report on wildlife for the Fort Mohave Land Sale area was completed by the Bureau of Land Management on July 9, 1976 (see Appendix B, p. B-1). Twelve wildlife species were listed in the Final Environmental Statement on page 77a as endangered species; however, under the present classification for the Endangered Species Act, only six of these species are officially listed by the U. S. Fish and Wildlife Service as endangered or threatened.

These species include:

southern bald eagle -- *Haliaeetus leucocephalus leucocephalus*

peregrine falcon -- *Falco peregrinus anatum and Falco peregrinus tundrius*

Yuma clapper rail -- *Rallus longirostris yumanensis* brown pelican -- *Pelecanus occidentalis*

Colorado River squawfish -- *Ptychocheilus lucius*

woundfin -- *Plagopterus argentissimus*

Literature searches, on-site inspection, and inventory of the land sale area by the BLM study team to determine the presence and extent of (or absence of) habitat which could support any endangered or threatened wildlife species (including those listed above) concluded the following:

Habitat for the bald eagle, peregrine falcon, brown pelican, Colorado River squawfish, and the woundfin does not occur on or adjacent to the Fort Mohave land sale area.

An existing 7.2 acres of possible Yuma clapper rail habitat exists within the land sale area. However, fragmentation of this acreage and present characteristics of the vegetation within this habitat area do not fulfill the habitat requirements of the Yuma clapper rail, as described in Appendix B, p. B-3. No evidence of this species presence was found during visual observation in March 1976, or during an intensive call-count survey conducted during the nesting season of 1976.

The cattail vegetation (the usual Yuma clapper rail habitat) on the land sale area has decreased approximately 50 percent since 1967, and is continuing to decrease due to a lowering of the water table caused by levees and river (water) management priorities. These cattail areas (7.2 acres) were found to be essentially dry during the period when the survey was conducted, and will soon be lost irrespective of, and unrelated to, the proposed action.

Flood Hazards

The flood hazard evaluation submitted by the Corps of Engineers indicates that the entire Fort Mohave land sale area is subject to shallow sheet flows (see Appendix C, Flood Hazards Evaluation for the Fort Mohave lands, p. C-1). Areas indicated by Zone B_{12}, as indicated by the Flood Hazards Map, p. C-2, are subject to shallow flow depths of six to twelve inches from the upland areas to the west caused by the 100-year-frequency flood, while Zone B_6 is subject to shallow sheet flow depths of less than six inches. Peak discharges at concentration points on the land sale area are indicated on the chart in Appendix C, p. C-1. (It should be noted that these discharges are not concentrated at a specific point location, but are determined along a "frontal line" corresponding to a drainage area above the line.) The Flood Hazards Map indicates an area between the Colorado River and the existing westernmost levee which would be inundated by a 100-year-frequency flood of the Colorado River. This area is indicated as Zone A on the map in Appendix C. The peak flows during such an occurrence are predicted to be no more than 50,000 cubic feet per second (cfs). The existing levee along the Colorado River is designed to contain 50,000 cfs, and therefore is capable of handling water flows from a predicted 100-year-flood. Water flows from a predicted Standard Project Flood (300 to 500 year occurrence) could overflow the existing westernmost levee.

On May 25, 1977, Executive Order 11988 on flood plain management was signed by President Carter (42FR;26951). This Executive Order requires the Department of the Interior to reduce the risk of flood damage loss; to minimize the impacts of floods on human safety, health, and welfare; and to restore and preserve the natural and beneficial values served by floodplains when the Department disposes of Federal lands.

Archaeology (Cultural Resources)

During 1976, the Nevada Archaeological Survey (NAS), Southern Division (since July 1, 1977 the Archaeological Research Center of the University of Nevada, Las Vegas Museum of Natural History), conducted (under BLM contract) a 50 percent cultural resource inventory of the Fort Mohave land sale area. In February 1978, the ARC completed the second phase cultural resource inventory of the Fort Mohave land sale area. Except for the floodplain on the western banks of the Colorado River, the second phase of the inventory covers all those lands not initially surveyed. (This floodplain is defined on the field methodology map for the cultural resources inventory, Appendix D, p. D-6.) No archaeological sites or isolated finds were located in the Colorado River floodplain during the first phase of the inventory; because of this and the nature of the floodplain (considerable depth of overburden, intermittent flooding, etc.) a 100 percent inventory was not warranted.

A limited survey of lands adjacent to the sale areas was to be performed as necessary to develop essential comparative site data and to define the boundaries of any site extending beyond the land sale area, but no peripheral sites were encountered. The methodology for both surveys is delineated in Appendix D, p. D-5 and D-16.

No archaeological sites or isolated finds were located in the easternmost portion of the Fort Mohave land sale area, which is composed of the Colorado River floodplain. The alluvial fan sloping from the west toward the Colorado River, including the terraces above the floodplain of the river, contained 48 historic or prehistoric sites on public lands which were inventoried and recorded. Two additional sites were located and recorded on the private land within the study area.

Located historic sites consisted of materials, structures, roads, and trail remnants associated with the Mojave Indians. Utilization of these lands by whites dates from the mid-nineteenth century to the present. Identified historic sites included: a cemetery (which was determined to be on private land), remains of the old (Mohave) Government Road, and remains of historic Mojave Indian living sites. Prehistoric sites consisted of lithic quarry workshops (stone tool-making areas), lithic scatters and concentrations, and some rock outline features. There were isolated finds of ceramics and lithics recorded and collected.

The Fort Mohave land sale area contains prehistoric and historical values of great significance, possibly of "over-riding national importance" in that:

Remnants of the (Mohave) Government Road in the form of artifacts, traces, and possibly associated structures have been identified on the subject lands.

Historical period sites in Sections 9 and 16, T33S, R66E, are apparently associated with late nineteenth century or early twentieth century occupancy by Mojave Indians. Such sites are extremely rare along the lower Colorado River and as such may have significant intrinsic value. These sites, in relation to the many identified aboriginal quarry sites, offer a unique opportunity for scientific inquiry. The presence of ethno-historic and prehistoric phenomena in such close proximity to one another, and in relatively pristine condition, presents a unique opportunity for using "direct historical approach" methods in resolving cultural chronology questions.

The reported discoveries of pottery associated with some of the quarry sites (a rare finding) also adds to the potential for resolving questions of cultural chronology along the lower Colorado River. The potential exists for data extrapolated from these lands being utilized for answering larger questions in North American archaeology.

Events of importance in North American history took place on these lands - Mojave and white battles that kept the (Mohave) Government Road from becoming an emigrant passage, and ultimately led to the demise of the Mojave nation. The Beal Camel experiment also operated over this route.

No one single historical or prehistorical value located on these lands would appear to merit inordinate consideration. What makes the Fort Mohave land sale area archaeologically and historically unique, is the fact that so many important values exist here in a relatively undisturbed setting.

Results of the survey, site recommendations, and summaries and conclusions of the Fort Mohave Cultural Resource Inventories are contained in Appendix D of this report, p. D-8 and D-34. Specific site description and inventory records indicating precise site locations within the land sale area are not printed within this report. The complete reports are at the Bureau of Land Management's Nevada State Office in Reno.

All prehistoric values recorded in the two NAS (now ARC) surveys are considered to be eligible for National Register listing under 36 CFR 800.10(4) criteria, in that these values (either individually or as significant elements of an archaeological district) "...have yielded, or may be likely to yield, information important in prehistory or history."

The identified cemetery is not considered eligible for National Register listing as it does not meet the criterion of 36 CFR 800.10(b). The portions of the (Mohave) Government Road which pass through the study area are considered eligible for listing in the National Register under one or more criteria established in 36 CFR 800.10. Identified Mojave Indian living sites are also considered eligible for National Register listing under one or more criteria established in 36 CFR 800.10.

Comments from the State Historic Preservation Officer and the President's Advisory Council on Historic Preservation are included in Appendix E, p. E-1.

Social-Economic Conditions Related to the Fort Mojave Indians

Approximately 400 members of the 660 member Fort Mojave Tribe live on the Reservation in the California Village (Needles) and the Arizona Village (Mohave County). The remaining 260 members are distributed among 30 cities in 12 states.

The Mojaves had lived in the land sale area for centuries before the appearance of the white man, but they have been subject to socialization into the Anglo culture since the mid 1800s. As a result, the Mojaves are gradually losing touch with their old culture.

High unemployment (31 percent) is the major problem facing the Fort Mojave Tribe. Those Tribe members who do work are primarily dependent on temporary Federal government jobs through Public Works and Economic Development Act funds. Other major problems include inadequate housing, low income levels, and low educational incentive on the part of the Mojave young people.

The Fort Mojave Tribe is developing its lands for agricultural use, primarily through leases to agribusiness firms. The largest leaseholder, the Colorado River Development Corporation (CRDC), is also under contract to eventually develop a resort community on the northern part of the Reservation, including portions within Arizona, California, and Nevada. Most of the land would be allocated to residential lot leasing, although the plans would probably include marinas, golf courses, and industrial parks. If Congress approves gambling on the Nevada portion of the Reservation, hotel-casinos would also be included in the CRDC plans. The resort community may be able to accommodate an eventual population of 30,000 residents.

New employment opportunities and increased income levels are expected to result from development of Reservation lands. All leases have a provision pertaining to employment of tribal members and specify that the Tribe will receive a percentage of gross receipts of business.

ENVIRONMENTAL IMPACTS

Vegetation: Endangered or Threatened Species

Literature, herbarium, and field searches for endangered or threatened flora species showed none occur within the proposed sale area.

Ferocactus acanthodes, a native barrel cactus highly prized for ornamental purposes, but not listed as endangered or threatened, may be partially or totally removed from the subject area if the proposed action were implemented.

Flood Hazards

A projected 100-year flood from the Colorado River, as shown on the Flood Hazards Map, p. C-2, could cause considerable damage to any developments in the area between the Colorado River and the existing westernmost levee. The development of waterways open to the Colorado River could increase the risk of flooding and resultant damage to property and life without the protection now provided by the present levee. A projected standard project flood (300 to 500 year occurrence) would overflow the levee system and cause considerable damage over a broader area.

Shallow flows of up to 12 inches from the upland areas to the west created by the 100-year flood could cause light flood damage throughout the Fort Mohave land sale area. (See Flood Hazards Map.) Flood depths and potential for damage would be dependent on construction measures undertaken, and could increase in relation to the density of buildings and paved areas constructed. Moderate to severe flood damage could occur in built-up areas during the 100-year flood.

Section 3(d) of Executive Order 11988 on flood plain management requires the Department of the Interior to attach appropriate provisions to conveyances in order to protect against such flood damages.

Archaeology (Cultural Resources)

Although no observable sites were encountered during the survey within the Colorado River floodplain, there is the possibility of subsurface cultural resources being found during development of the area. Development could disturb or destroy a number of the located sites on the alluvial fan and river terrace.

Transfer of these lands (or virtually any portion of these lands) to the State of Nevada for development as proposed under Alternatives A or B, could constitute an "adverse effect" on one or more of the identified cultural resource values as defined under one or more of the criteria established in 36 CFR 800.9. Virtually any development or alteration of these lands that is not oriented toward preserving (conserving) the identified values could result in "...destruction or alteration of all or part of the property" (36 CFR 800.9a); "isolation from or alteration of its surrounding environment" (36 CFR 800.9b); "introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting" (36 CFR 800.9c); and possibly "neglect of a property resulting in its deterioration or destruction" (36 CFR 800.9c).

Social-Economic Conditions Related to the Fort Mojave Indians

To assess social and economic impacts on the Mojaves, Alternatives B (the Beaumont proposal described in the Final Environmental Statement, and considered the "worst case" situation) was analyzed. (See Appendix F, p. F-5.) The land sale area has been changing rapidly from a sparsely populated area to an area of small fast-growing recreational communities. Implementation of Alternative B would accelerate this rate of change.

The major impact on the Fort Mojave Tribe would involve loss of future tribal income. The Colorado River Development Corporation (CRDC) has indicated it may scrap its plans to develop a resort-residential community on the leased land if a development such as Alternative B occurs on adjacent land. This would result in loss of income to the Tribe. Alternative B would compete with CRDC development for residential lot income. It is projected that if both Alternative B and the CRDC plans were implemented there would be a large oversupply of lots, and CRDC would be at a competitive disadvantage because of the corporation could only offer subleases, whereas the developers of Alternative B would be able to offer lots for sale or lease. (The trend in the area shows a preference toward ownership rather than lease.) Revenues to the tribe would be lowered because of this competitive disadvantage.

Coordination and cooperation between the developers of Alternative B and the CRDC could result in benefits to both concerns in terms of lowered unit costs and compatible developments. If no coordination occurs, both developments would suffer.

The impact on employment of Tribal members is unknown. Although on-Reservation employment would decline, the overall impact on employment would depend on how well the Mojaves could exploit increased off-Reservation employment opportunities. Impacts on social and cultural values would be similar with or without implementation of Alternative B. Implementation of Alternative B could delay the rate of decrease of the Mojaves' dependence on the Federal Government (for such support as welfare). The Mojaves view dependency on the Federal Government as undesirable, and would like to become less dependent. The level of health services and educational services for the Tribe should remain unaffected.

POSSIBLE MITIGATING AND ENHANCEMENT MEASURES

The following measures could mitigate the adverse environmental impacts or enhance the existing environment. The specifics of any such measures will be developed as terms and conditions of the sale, pursuant to the contract between the Department of the Interior and the State of Nevada.

Wildlife: Endangered or Threatened Species

Cattail areas in excess of 20 acres could be developed (within the proposed off-river water developments as indicated in Alternatives A and B) to provide likely habitat for the Yuma clapper rail.

Flood Hazards

Section 3(d) of Executive Order 11988 states that when floodplain land are conveyed to non-Federal parties, the Federal agency shall: (1) reference in the conveyance those uses that are restricted under identified Federal, State, or local floodplain regulations; (2) attach other appropriate restrictions to the uses of the property by the grantee or purchaser, or any successors, except where prohibited by law; or (3) withold such properties from conveyance.

If the Fort Mohave lands are conveyed, the Secretary of the Interior could require the State of Nevada to prepare a floodplain management plan and to submit the plan to the Department of the Interior for approval prior to conveyance of the land. The Secretary could also insert specific covenants and conditions into the patent designed to protect public safety, health, and property from flood hazards, and to preserve the natural values of the floodplain.

Archaeology (Cultural Resources)

Identified cultural resource sites with the exception of the (Mohave) Government Road could be avoided. If avoidance of these sites during development is not reasonable or prudent, the Nevada Division of Colorado River Resources could be required to clear any mitigating measures with the State Historic Preservation Officer. Representative samples of historic and prehistoric sites could be maintained under a preservation plan approved by the

State Historic Preservation Officer. These mitigating measures could include acquiring the services of professional archaeologists/historians for mapping, extensive photography, and implementation of a controlled method for sampling and/or salvage of data from all sites as indicated in the Cultural Resources Inventory Reports. (See Appendix D, p. D-9 and D-34.)

Should any cultural resource sites be discovered during developmental operations, the Nevada Division of Colorado River Resources could be required to temporarily suspend operations until mitigating measures satisfactory to the State Historic Preservation Officer have been completed.

Social-Economic Conditions Related to Fort Mojave Indians

A coordinated development plan, drawn up in consideration of the CRDC development on the adjoining Reservation property, could alleviate some of the impacts the proposed development might otherwise have on the Mojave Tribe. For example, shared development of community infrastructures (sewage systems, school systems, etc.) would decrease the cost per unit. Complementary rather than competing developments could increase the profits of both groups.

ANY ADVERSE EFFECTS WHICH CANNOT BE AVOIDED
SHOULD THE PROPOSAL BE IMPLEMENTED

Archaeology (Cultural Resources)

Because of the configuration of the (Mohave) Government Road in relation to the Fort Mohave land sale area, development as stated in either Alternative A or B could result in unavoidable adverse impacts. Destruction of all or a portion of the Road could result during development of the Fort Mohave land sale area, while the character and setting of the adjacent area would change.

While there is a possibility that subsurface archaeological sites would be impacted by development of the area, adverse impacts could be greatly limited by mitigating measures as discussed in the previous section, p. 13 .

Social-Economic Conditions Related to the Fort Mojave Indians

Unavoidable adverse impacts on the Fort Mojave Tribe would involve a decrease in future tribal income.

Other

No other unavoidable impacts additional to those listed in the Final Environmental Statement have been identified. The conclusions on p. 100 of the Final Environmental Statement concerning adverse impacts on wildlife species have been modified by this Final Supplement.

CONSULTATION AND COORDINATION IN THE REVIEW OF THE DRAFT SUPPLEMENT

Requests for comments on the Draft Supplement were made to the individuals, interest groups, and agencies in the following list. An asterisk indicates those who responded. (A complete list of respondents appears in Appendix G, p. G-1, as an index to the comment letters.)

Congressional Delegation, Nevada

- Senator Howard W. Cannon
- Senator Paul Laxalt
- Representative James D. Santini

Federal Agencies

- Advisory Council on Historic Preservation*
- Department of Agriculture
  - Soil Conservation Service
- Department of Commerce
  - National Weather Service
- Department of Defense
  - Army Corps of Engineers*
- Deparment of Health, Education, and Welfare
- Department of Housing and Urban Development
- Department of the Interior
  - Bureau of Land Management*
  - Bureau of Reclamation*
  - National Park Service*
  - U. S. Fish and Wildlife Service*
  - U. S. Geological Survey
  - Bureau of Indian Affairs*
- Energy Research and Development Administration
- Environmental Protection Agency

State Agencies (Nevada, unless specified)

- Office of the Governor
- State Planning Coordinator* (25 copies, distributed to State agencies)

State Historic Preservation Officer

Division of Colorado River Resources*

Department of Fish and Game*

Department of Parks and Recreation*

Nevada State Museum

Museum of Northern Arizona

Local Agencies

Bullhead City Chamber of Commerce

Clark County Board of Commissioners

Clark County Courthouse

Clark County Department of Parks and Recreation

Clark County Health Department

Clark County Planning Commission

Clark County Public Works

Clark County Regional Planning Council

Clark County School District

City of Las Vegas Planning Commission

City of Henderson Planning Commission

City of North Las Vegas Planning Commission

City of Needles

Las Vegas Valley Water District

Orange County Flood Control and Drainage Department

Conservation-Interest Groups

American Camping Association

Audubon Society

California and Nevada Development Organization

Central Nevada Development Authority

Colorado River Advisory Commission

Environmental Defense Fund

Foresta Institute

Fort Mojave Tribal Council*

Fraternity of the Desert Bighorn

Frontier Girl Scout Council*

Heartline

Las Vegas Area Council - P.T.A.

League of Women Voters

Life Forum

Natural Resources Defense Council*

Nevada Conservation Forum

Nevada Mining Association

Nevada Open Spaces Council

Nevada Outdoor Recreation Association*

Nevada Wildlife Federation

Sierra Club

Southern Nevada Environmental Forum

Southern Nevada Off-road Enthusiasts

Southern Nevada Resource Action Council

Private Companies-Utilities

Colorado Development Corporation

Combustion Engineering, Inc.

John B. Knight Company

Monte Carlo Resort

Nevada Power Company

Odie Loop's Nevada Club

Southern California Edison Company

Valley National Bank

Private Citizens

Dr. Janice Beatley

John E. Bryson

Thalia Dondero

Dr. Samuel M. Ford

Jean Ford

Virlis L. Fischer

Howard Gray

Carl Shaw

Copies of the Draft Supplement were available for public review at the following locations:

Bureau of Land Management offices

Washington Office of Public Affairs
18th and C Streets
Washington, D. C. 20240

Nevada State Office
Room 3008, Federal Building
300 Booth Street
Reno, Nevada 89509

Las Vegas District Office
4765 Vegas Drive
Las Vegas, Nevada 89102

Public Libraries

Las Vegas City Library
400 East Mesquite Street
Las Vegas, Nevada 89101

Library
University of Nevada, Las Vegas
Las Vegas, Nevada 89109

COMMENTS AND RESPONSES

The Draft Supplement to the Final Environmental Statement was filed with the Council on Environmental Quality on March 8, 1977, and made available to the public on March 9, 1977. The notice of availability was published in the March 11, 1977, issue of the Federal Register (Vol. 42, No. 48).

A public comment period was scheduled to provide the concerned publics the opportunity to review and offer comments on the adequacy of the Draft Supplement. The 30-day comment period ended April 11, 1977.

During the public comment period 31 letters were received from Federal and State agencies, interest groups, and individuals. Fourteen comment letters were received after the close of the comment period.

All comment letters were reviewed to determine if they met the required criteria for response, i.e., they discussed the adequacy of the Draft Supplement. Comments which presented new data, questioned facts and/or analyses, and raised questions or issues bearing directly on the Draft Supplement were fully considered, evaluated, and responded to. Subsequent required changes or additions in the text of the Draft Supplement have been made and incorporated in the Final Supplement.

Only comment letters which discussed the adequacy of the Draft Supplement have been included in Appendix G of the Final Supplement; however, all letters received have been sent to the Director, Bureau of Land Management, and the Council on Environmental Quality for review and will be available for public inspection at the Bureau of Land Management, Room 3008, Federal Building, 300 Booth Street, Reno, Nevada.

In the following Comment and Response Section, comments are numbered according to the control number of the letter in which they appear. (Comment 19-3 is the third comment from letter No. 19 - Nevada Division of Colorado River Resources.) Similar comments by different respondents are cross-referenced to the initial comment and its response. The headings under which the comments and responses appear are those used in the Draft Supplement, plus such additional headings as were found necessary during preparation of the Final Supplement.

A complete list of respondents appears in Table 2, p. 20, and as an index to Appendix G, p. G-1.

(Note: During preparation of the Final Supplement, some Appendices have changed letter designation. Refer to the list of Appendices on p. iii.)

TABLE 2
LIST OF RESPONDENTS AND AREAS OF CONCERN

Letter No.	Respondent	DATE RECEIVED	NO SUBSTANTIVE COMMENTS	VEGETATION	ENDANGERED OR THREATENED PLANTS	WILDLIFE	ENDANGERED OR THREATENED WILDLIFE	YUMA CLAPPER RAIL	FLOOD HAZARDS	CULTURAL RESOURCES	SOCIAL-ECONOMIC CONDITIONS	MITIGATING MEASURES	ALTERNATIVES TO THE PROPOSED ACTION	EDITORIAL	LEGAL/PROCEDURAL			
															SECTION 7, FISH AND WILDLIFE COORDINATION	FEDERAL LAND POLICY AND MANAGEMENT ACT OF 1976	CULTURAL RESOURCES E. O. 11593	CULTURAL RESOURCES 36 CFR 800
001	Nevada Outdoor Recreation Association, Inc.	2/24/77						■										
002	Mr. J. R. Ray Alcorn	3/16						■										
003	Nevada State Parks System (1)	3/18								■								
004	Ms. Mary DeDecker	3/21		■														
005	Mr. Tom Heindel	3/22						■										
006	National Park Service	3/28	X															
007	BLM, Utah State Office	4/1	X															
008	BLM, Idaho State Office	4/7	X															
009	State of Nevada, Division of Colorado River Resources (1)	4/11	X															
010	Fish and Wildlife Service	4/11				■												
011	Ms. Tina Nappe	4/11									■							
012	California Native Plant Society	4/11		■	■	■	■		■	■								
013	Natural Resources Defense Council, Inc.	4/12													■			
014	Mr. Richard J. Vogl (1)	4/12		■														
015	University of Nevada, Las Vegas, Department of Anthropology	4/14								■								
016	Mr. Ike C. Eastvold (California Desert Archaeology Committee)	4/14								■	■							■
017	Mrs. Martha McLean	4/15	X															
018	Nevada State Parks System (2)	4/18															■	
019	Nevada State Clearinghouse	4/20																
019A	Division of Colorado River Resources (2)	4/20						■	■	■		■		■			■	
019B	Department of Fish and Game	4/20					■											
020	Department of the Army, Corps of Engineers	4/25							■									
021	Mr. Richard J. Vogl (2)	4/25	X															
022	Bureau of Reclamation	4/28							■									
023	Mr. Scott Bailey	5/2	X															
024	Mr. Richard Spotts	5/2	X															
025	Ms. Elizabeth Bingham	5/4	X															
026	Mr. P. C. DeBaryshe	5/5	X															
027	Ms. Erica C. Garcia	5/5	X															
028	Ms. Lonnie Carden	5/9	X															
029	National Wildlife Federation	5/11											■			■		
030	Advisory Council on Historic Preservation	5/11								■								■
031	Mr. Bill Vincent (Editor, The Nevadan)	5/11	X															
032	Frontier Girl Scout Council (Mrs. Mark Line)	5/13	X															
033	Ms. Margurite Cristoph	6/10	X															
034	Ms. Joanne L. Campbell	6/15	X															
035	Mr. Robert Stijn	6/15	X															
036	Mr. Henry Peck	6/20	X															
037	Ms. Sherry L. Roberts	6/21	X															
038	Ms. Yvonne E. Carter	6/28	X															
039	Mr. Siegfried Bing	7/14	X															
040	Mr. and Mrs. J. N. Lally	7/20	X															
041	Mr. Joe Newman	7/20	X															
042	Ms. Maggie L. McShan	8/9	X															
043	Mr. Jerry Kein	9/27	X															
044	Fort Mojave Indian Tribe	7/11									■							
045	Bureau of Indian Affairs	10/28									■							
046	State of Nevada, Division of Colorado River Resources (3)	1/13									■							

VEGETATION

COMMENT 4-1:

That southern tip of Nevada is a fine example of the Sonoran Desert. It is Nevada's only site for the smoke tree (Dalea spinescens) and is thought to be the most northerly occurance of that species. That is of scientific significance. It indicates the possibility of unusual ecological values associated with it. We are learning, sometimes by disastrous means, that such clues must not be disregarded. No special habitat should be allowed to be destroyed or degraded, even though we may not know its full significance at this moment in time.

RESPONSE: Although this northerly occurrence of the smoke tree may be of some scientific significance, the smoke tree, Dalea spinosa, is not on the proposed listing of endangered or threatened plants and therefore was not considered in the Endangered Species Act Compliance Report for Plants. The occurrence of the smoke tree in the proposed sale area has been noted in the Final Environmental Statement of January 23, 1975. (INT FES 75-10.)

COMMENT 12-3:

Appendix D of the Supplement, Cultural Resources Inventory, page 33(7), includes the following picture of the biota and features of importance:

"This region is the only locale where smoke tree (Dalea spinosa) occurs in the State of Nevada (Bradley, 1966)".

RESPONSE: See Response to Comment 4-1 in this Section.

COMMENT 14-1:

Upon examination of this document, I found the discussions of the various vegetation types present as to their compositions and relative values to be inadequate. As a result, I intend to conduct a survey of the parcel, and will submit my results to your office by April 20.

I am a plant ecologist-botanist with 16-years' experience studying California plant communities, and believe that the plant communities of this parcel have not been described in terms of their value and compositions, thereby making it impossible to make a valid assessment of the botanical resources.

RESPONSE: A discussion of the vegetative types was presented in the Final Environmental Statement, INT FES 75-10. Vegetative data presented in the Draft Supplement were necessary supplemental data to the Final Environmental Statement on the endangered or threatened plants.

Richard J. Vogl did provide a more comprehensive inventory of the existing vegetation of the Fort Mohave sale area. (See comment letter No. 021.) No endangered or threatened plants were identified in the course of this inventory.

ENDANGERED OR THREATENED PLANTS

COMMENT 12-2:

However, the wildlife and vegetation are dealt with in the supplement, pages 3-6, in a very brief manner which is also reflected in Appendix A, Report on Endangered Species Act Compliance for Vegetation (page 15) and in Appendix C, Report on Endangered Species Act Compliance for Wildlife (page 23). Actual field work for plants was the 3-day period of June 8, 9 and 10, 1976, and for animals a 3-day period during the week of March 9-13, 1976, and an additional two searches for Yuma clapper rail on April 19-20 and May 26-27 of 1976, which were without success. We submit that such inspections did not cover an adequate time span and therefore were insufficient to establish a true inventory of the threatened or endangered species and of the flora and fauna present.

RESPONSE: (Appendix C is now Appendix B.) The Fish and Wildlife Service, which exercises jurisdiction under the Endangered Species Act, has commented on the Draft Supplement and stated that the supplement adequately covers the subjects which fall within their areas of jurisdiction. (See comment letter No. 010, p. G-3.)

A botanical survey conducted on April 15, 16, and 17, 1977 by Richard J. Vogl and others did not show any plant species present within the area which are being considered for threatened or endangered status. (See comment letter No. 021, p. G-11.)

WILDLIFE

COMMENT 10-1:

We would like to take this opportunity to reiterate Service concerns regarding retention and preservation of the floodplain, especially the 2,700 acre area adjacent to the Colorado River.

This area presently contains some valuable wildlife habitat, but more important, it provides enormous potential for wildlife enhancement. As indicated in earlier Service comments on the draft EIS, it appears that, of the alternatives offered, Alternative C will best protect the natural resource values in the project area.

RESPONSE: Alternative C in the Final Environmental Statement (INT FES 75-10) considered retention of the Colorado River floodplain (within the proposed sale area) in public ownership. The alternatives to the proposed action will be considered prior to a final decision.

COMMENT 12-1:

We believe the 9,000 acres involved should remain in Federal ownership, preferably as a wildlife refuge or management area, for the reasons given below. We urge your consideration of these points in arriving at your decision concerning the disposition of this land. These lands obviously have the qualities of prime wildlife refuge and should be considered for that designation.

RESPONSE: See Response to Comment 10-1 in this Section.

ENDANGERED OR THREATENED WILDLIFE (RAPTORS)

COMMENT 19B-1:

However, the fact should be considered that we have documented seasonal use by peregrine falcons on the lower Colorado River in October and March. Also, Bald Eagle observations have been recorded for fall, winter and spring months (Oct.-March). In other words, these endangered species find this area suitable for use seasonally regardless of habitat requirements.

Our recommendations would be that mitigative action should include a continuous monitoring survey for endangered species use of this area and plans to protect wintering areas from development.

RESPONSE: The lack of large trees for perching of bald eagles on the subject land makes the area poor habitat for wintering bald eagles and, for all practical purposes, precludes use of the area by bald eagles.

The near virtual loss of prey species habitat for ducks and shore birds due to channelization of the Colorado River is a severe limiting factor for use of the proposed sale area during migration by peregrine falcons.

Use of the area by migrating or wintering raptors is severely limited, and therefore a continuous monitoring survey for these raptor species will not be included as a mitigating action.

ENDANGERED OR THREATENED WILDLIFE (YUMA CLAPPER RAIL)

COMMENT 1-1:

We now have three expert witnesses who have seen this rare and endangered species in the Fort Mohave tract and as far north as Las Vegas Wash. Eight (8) of these unique shorebirds were seen at one time in Las Vegas wash by the son of J. R. "Ray" Alcorn** (Fallon, Nevada) as well as sightings made by Mr. Alcorn himself, which according to him date back to 1959. Still another sighting was made during the winter of 1971-72 by Forest Reynolds (Blythe, California) a field warden of the Calif. Fish & Game Dept. It was Mr. Reynold's photograph (a fact that we had to keep confidential till now), taken in 1971 in the marsh area of the 9,000-acre Fort Mohave tract, which we included in our statement for the draft EIS on this matter. We feel these new sightings establishes, without a shed of doubt, the need to recognize all Colorado River public lands south of Las Vegas as critical habitat for this officially recognized endangered species. We therefore submit that any transfer of the Fort Mohave lands to the state--which refuses to recognize any environmental safeguards; indeed insists on development of such critical habitat lands--must be rejected, under terms of the Endangered Species Act.

RESPONSE: As stated in the Endangered Species Act Compliance Report for Wildlife, Appendix B, suitable habitat for the Yuma clapper rail does not exist in the Fort Mohave sale area. The deteriorated condition of the floodplain vegetal cover is substantiated in the report of vegetative survey conducted by Richard J. Vogl, April 15, 16, and 17, 1977. (See comment letter No. 021, p. G-11.)

The Fish and Wildlife Service found the Draft Supplement adequately discusses subjects which fall within that agency's areas of expertise and jurisdiction.

COMMENT 2-1:

I understand that there is some question about the status of the Clapper Rail in Nevada. On Sept. 6, 1959 Mr. Al Jonez and Mr. Albert Alcorn reported seeing 8 of these rails at the Las Vegas sewage disposal drain ditch. Both of these men worked for the Nev. Fish & Game and are trained wildlife biologists. On another date, Sept. 19, 1959, Albert Alcorn reported seeing a lone clapper rail at this same location in Clark County, Nevada. I suggest that a few of these birds may be found all along the Colorado River, in suitable habitat, as far north as Overton. I realize that there are few records of this rail in this area, but they are often present in an area without people knowing about it. The habitat that is suitable for these birds in this area is very limited and I hope it can be maintained.

RESPONSE: See Reponse to Comment 1-1 in this Section.

COMMENT 5-1:

While birding along the Colorado River, near Blythe, California, I discussed the occurrence of th Yuma Clapper Rail with two men from the California Department of Fish and Game. Both seemed very knowledgeable, and stated that these birds were found in the area under discussion. I would certainly hope that we would not trade, sell, give away or take any action that might affect this rare bird.

RESPONSE: See Response to Comment 1-1 in this Section.

COMMENT 19A-5:

Wildlife mitigating measures identifies development of cattail habitat (20 acres) in contradiction to the natural (unaltered) decline of habitat and the absence of the Yuma Clapper Rail. Since any of the actions identified in the Final Statement do not impact on suitable habitat, a development of a habitat (20 acres) cannot be considered as a mitigating measure but only a development of a potential habitat. See page 27 (p. 11) "In view of the preferences exhibited throughout its range for habitat areas in excess of 20 acres in size, the significance of these cattail pockets to the Yuma Clapper Rail is nil."

RESPONSE: This comment is correct. The proposed measure would be an enhancement measure for development of habitat for the Yuma clapper rail, and would be possible under Alternatives A, B, C, and D. See section on mitigating and enhancement measures in the Final Supplement, p. 13.

FLOOD HAZARDS

COMMENT 12-5:

Concerning flooding, the entire Fort Mohave lands area is subject to shallow sheet floods, in addition to 50-year or 100-year flooding (Supplement, page 4). This of course, while disastrous and expensive for developments, would be marvelously beneficial and advantageous for a wildlife refuge. We call your attention to the responsibility of heads of executive agencies as quoted in the Environmental Defense Fund letter of March 5, 1975 (Supplement, page 53):

> "...heads of the executive agencies shall provide leadership in encouraging a broad and unified effort to prevent uneconomic uses and development of the Nation's flood plains..."

RESPONSE: As stated in the mitigating measures section for flood management, the Nevada Division of Colorado River Resources could be required to develop a flood management plan to provide protection from flood hazards within the floodplain and on the alluvial fan. This plan could be of the level that would meet the criteria for obtaining Federal flood insurance.

COMMENT 19A-4:

Supporting data and information on Flood Hazard Evaluation should be provided in Appendix B and should identify drainage areas, topography and natural drainage courses considered, calculations, assumptions, data, etc. The Corps of Engineers' letter dated September 7, 1976 identifying that the hazards are based on preliminary studies. Executive Order 11296 appears to be unfulfilled (Ref. III). Because of the map scale it is impossible to determine the extent of the overflow limits of the Colorado River in the flood plain and the relationship of the Corps of Engineers analyses as compared to the Bureau of Reclamation analyses (Ref. IV).

RESPONSE: Flood data provided by the Corps of Engineers have been substantiated by the Bureau of Reclamation and corrected in the case of the maximum predicted flows from a 100-year flood occurrence. The overflow limits of the Colorado River during a 100-year flood would be that area between the river and the levee (indicated as Zone A on the Flood Hazards Map, p. C-2).

COMMENT 21-1:

However, the text of the draft supplement near the bottom of page 4 states: "The Flood Hazards Map indicates that area within the flood plain (and within the land sale area) which would be inundated by a 100-year-frequency flood of the Colorado River, the peak flows during such an occurrence reaching as high as 74,000 cfs. The existing levee along the Colorado River is designed to pass 50,000 cfs, 24,000 cfs less than the 100-year flood maximum." The latter part of this statement beginning with "the peak flows..." is incorrect. The 100-year flood is no more than 50,000 ft^3/s, the magnitude of the levee-design flood, and it will be contained by the levee with an ample freeboard. Mainstream flooding due to a 100-year event will be confined to the areas identified on the Corps' map.

RESPONSE: These data have been incorporated into the text, and the text has been corrected in relation to the predicted 100-year flood water flow in the Colorado River.

COMMENT 20-2:

Page 12, last paragraph: The reference to "waterways" should be expanded to denote what waterways are meant. Also, is it inferred, in the last sentence of the paragraph, that the present levee will wash out for a 100-year event, or that it will be removed as part of the proposed plan? This should be clarified.

RESPONSE: Waterways are proposed projects which would be constructed (dredged) to create recreation water-use areas, marina sites, boat slips, launching ramps, docks, lakes, houseboat areas, etc., as proposed in Alternatives A and B. The reference that the present levee will wash out for a 100-year event has been corrected.

COMMENT 20-4:

Page 13, 4th paragraph: The reference to "waterways" should be expanded to denote what waterways are meant and the inference that they may be intentionally provided should be clarified. It should be noted that our flood hazard evaluation was for existing conditions and that development of these "waterways" could alter the analyses.

RESPONSE: (See reply to Comment No. 20-2 in this Section for clarification of the term "waterways.") The maps indicating proposed waterways on development Alternatives A and B indicate that the existing levee would be opened to provide a boating channel from the proposed waterways to the Colorado River. The inlets and/or outlets from the waterways through the levee to the Colorado River could be designed so that they could be closed (shut off) in the event of flooding in order to prevent damage.

COMMENT 20-6:

Appendix B, Table of Discharges: It should be noted that some of these discharges are not concentrated at a specific point location, but are determined along a "frontal line" corresponding to a drainage area above the line.

RESPONSE: (Appendix B is now Appendix C.) These data clarifying discharges have been noted in the Final Supplement text.

CULTURAL RESOURCES

COMMENT 3-1:

We do not see a similar Bureau of Land Management acknowledgement or affirmation of the recommendations made by the University of Nevada, Las Vegas, History Department and the Nevada State Historical Society, Reno, relative to known historic sites and mitigating measures against adverse affect. Perhaps the reproduction of the comments as incorporated in the draft was intended to serve this purpose, but we would prefer to read a more affirmative and direct declaration on the part of the Bureau of Land Management.

RESPONSE: Mitigating measures incorporating recommendations of the Nevada Archaeological Survey, Southern Division, (now the Archaeolocial Research Center, UNLV) concerning historical sites have been added to the mitigating measures section, p.13 .

COMMENT 12-4:

Appendix D. of the Supplement also recommends that the historic sites be studied further to determine their significance; that certain prehistoric sites be photographed, extensively mapped and sampled and that searches be made to locate other possible prehistoric sites, pictographs and petroglyphs. It further states on page 43(75): "Without the recommended mitigation for the sites already recorded and historic and prehistoric surveys of the adjacent northeast and southwest quadrants of the second terrace and alluvial fan, no recommendation for clearance can be made to allow for the developments proposed in this area for the BLM Environmental Statement, 1975." (Underlining added).

RESPONSE: See Response to Comment 3-1 in this Section. Additionally, the second survey has been completed to 100 percent standards (see Appendix D, p. D-11).

COMMENT 15-1:

I would question the ability of the State of Nevada to insure the protection of the resources inventoried in this report and cited as historical or prehistorical, since the State of Nevada has not had a SHPO Office since July 1, 1976 and I am not certain if that office is functioning even yet. I realize that the State is attempting to re-establish this Office, but until such a time as it is determined that the State is supporting a SHPO Office recognized by the Federal Government, there is not assurance that cultural resources on State lands can be effectively inventoried, protected, preserved or mitigated should urban or other incroachments affect it.

RESPONSE: The State of Nevada has complied with all applicable Federal regulations, and has a State Historic Preservation Officer and staff.

COMMENT 16-3:

My fourth area of concern is that, although Mr. John M. Townley of the Nevada Historical Society in his letter of November 5, 1976, (EIS supplement, p. 31) points out that "comparison of the project map with the 19th century maps of the area showed that the road extending south from Section One, T12N, R65E, at BM 1406, to Section Seventeen, T12N, R66E, and beyond, was part of the Government Road connecting Fort Mohave and San Bernardino," this highly important historical resource is not mentioned again in your EIS Cultural Resource Inventory, muchless evaluated for its National Register potential. This unexplained omission is of great concern since you obviously have on the subject property an historical resource which is universally deemed (cf. the definitive works of Mr. Dennis Casebier) to have significantly contributed to "the broad patterns of our history," as defined under criteria #1 of 36 CFR 800.10.

RESPONSE: The assessment of the Government Road has been completed through the Archaeological Research Center survey of February 1978 (See Appendix D, p. D-11, and text, p.6 .)

COMMENT 19A-18:

Page 43 (p. 73) Survey units 14-1 and 23-1 shown on map on page 44 but not tabulated.

RESPONSE: Listed survey units 13-1, 13-4, 24-1, and 24-4 on page 43 of the text (p. 73 under floodplains) should be 14-1 and 23-1.

COMMENT 19A-20:

Page 45 and 46 (pages 79, 80, 81 and 82) No reference is made to survey unit nor is a description of site number, catalog number shown. The information is useless to the reader unless definition is provided.

RESPONSE: References to survey unit, site number, and catalog number are shown on maps and site forms which also indicate specific descriptions and locations which could lead to destruction (vandalism, unauthorized collecting, etc.) of the sites if published. These have been omitted from the report included in the Draft and Final Supplement; however, the entire report is at the BLM Nevada State Office in Reno.

SOCIAL-ECONOMIC FACTORS

COMMENT 11-1:

I am also wondering if other states dependent on Colorado River water supplies have indicated any concern about the source of water and sewage treatment. Has Clark County agreed to share its Colorado River allotment with any proposed development? Or conversely, under Nevada Water Law, is there sufficient appreciation of the relationship between ground and surface water, so that if development depends on wells, Colorado River water is not being sucked out to supply the community.

What will be the industry to support the community? If residents commute to Las Vegas what effect will this have on air quality and energy consumption? I add the energy consumption aspect because I feel that eventually states will be responsible for reducing energy consumption. All of us throughout Nevada will depend on what others do. A major use of energy is transportation between work, home, and stores; this area will be the most difficult to reduce.

RESPONSE: Potential impacts of the proposed action and the alternatives have considered population, water, sewage treatment, transportation, solid waste disposal, public services, utilities, air quality, and off-site recreational uses. These various impacts have been identified and discussed in the Final Environmental Statement (FES 75-10).

COMMENT 16-4:

You can then imagine my apprehension when I learned that your proposed sale of lands would culminate in the establishment of extensive new facilities and population influx to this rich, largely unprotected area. My apprehension grew when I found that your EIS did not take into account secondary impacts from the anticipated influx of population. I consider this as serious an omission as if omitted from an impact statement for a proposed power plant such as, say, the Sundesert Nuclear Proposal farther south by Blythe, California. That particular project will result in about 7,200 new residents during the peak construction phase. I found no data detailing the number of new residents and occasional users attracted to the area by your proposed sale, nor the impact these people would have, particularly by way of off-road vehicle impacts, to the area.

RESPONSE: See Response to Comment 11-1 in this Section.

COMMENT 44-1:

We find that very little has been mentioned of the Impact these proposed land sales will have on the Fort Mojave Indian Reservation.

RESPONSE: BLM Staff personnel have prepared a supplementary report concerning the social and economic conditions related to the Fort Mojave Indian Tribe. This report was prepared in consultation with the Fort Mojave Indian Tribe and the Bureau of Indian Affairs. The complete report appears as Appendix F of the Final Supplement, and sections extracted from this report have been included in appropriate sections of the Final Supplement text.

COMMENT 45-1:

We are aware that in the Statement, the only mention of the Fort Mojave reservation is on pages 12 and 18, referring to a 99-year lease held by the Colorado River Development Corporation. It is indeed strange that no comment was solicited from the Bureau of Indian Affairs, nor from the tribal lessee, prior to publishing FES-75-10.

We understand a socio-economic report on this proposed land sale will be completed soon. It is hard to believe that such a report would be finalized without input from the Tribe.

With the above points in mind, I respectfully request that more time be given to the Fort Mojave Indian Tribe and to their affected lessee in order for them to prepare statements reflecting the impact of the proposed land sale and to prepare alternative measures to the plan.

RESPONSE: See response to Comment 44-1 in this section. Additionally, in response to the statement that no comment was solicited from the Bureau of Indian Affairs, the Bureau was issued copies of the Draft and Final Environmental Statement and of the Draft Supplement with appropriate cover letters, when these documents were released for public review.

COMMENT 46-1:

There could be no possibility of any private or public development if development was made contingent in any way on the direction wishes of a private profit making corporation which would no doubt object to any competitive development of the adjacent area. In the light of all the undocumented disclosures contained in the studies, the vast amount of unknown quantities such as the question of gaming on reservation lands, the alleged modifications of CRDC plans, etc., and the fact that Congressional action (PL 86-433) was enacted before the CRDC lease, the State of Nevada should not be made subservient in any manner to that company. Such a restriction should be entirely deleted or even mentioned as part of the social economic conditions.

RESPONSE: The State of Nevada, Division of Colorado River Resources, strongly objects, as stated above, to any terms or conditions of sale which may be imposed by the Secretary of the Interior which would make the sale of the Fort Mohave lands contingent in any manner on the development of the adjacent Fort Mojave Tribal lands by the Fort Mojave Indians or their developer, the Colorado River Development Corporation.

MITIGATING MEASURES

COMMENT 19A-6:

Mitigating measures relating to flood hazards and archaeological values are not identified. Only further investigations or studies are identified which may or may not require mitigating measures. Pursuant to Executive Orders 11593 and 11296, and Article VIII of the Amendment to Sale Contract, the identification of environmental and related impacts are the responsibility of the Secretary of Interior. (Ref. V)

RESPONSE: Mitigating measures for cultural resources (archaeological values) are specified in the Cultural Resources Inventories, Appendix D, p. D-9 and D-17, and are discussed in the Final Supplement on p. 13 .

The existing environment and impact sections for flood hazards adequately describe the flood hazard for the proposed sale area and the potential impacts. Because of the general nature of the Master Plan of the Fort Mohave Development area, it may be necessary for a Flood Management Plan to be developed to mitigate the possible flood hazard impacts.

COMMENT 19A-2:

The information provided as to environmental impacts or mitigating measures implies a proposed action as described under Alternative B in the Final Statement, i.e. on page 13 "Waterways to be developed under the proposed action could result in additional cattail sites which would fulfill the habitat requirements of the Yuma Clapper Rail". On page 9 of the final statement it clearly indicates that the alternative actions are identified to represent both minimum and maximum development and -- "Actual development could be something in between". (Ref. I)

Flood Management planning identified in mitigating measures assumes a current and identifiable development plan which is not available (See Comment 1 above). Additionally, we question the need of approval of the Secretary of Interior for conformance to Federal Insurance Administration National Flood Insurance Program since it relates to qualification for financing developments.

RESPONSE: The reference to "Waterways to be developed under the proposed action" has been corrected to refer to Alternatives A and B.

A Flood Management Plan may be required to provide adequate consideration for development in relationship to potential flood hazards which have been identified. It has not yet been determined who would approve such a plan.

ALTERNATIVES

COMMENT 29-2:

And second, if it is determined that the land should be transferred to comply with the 1960 Act, would it not be in the greater interest of the public to transfer the tract to a state agency or state educational institution which would continue to administer the area undeveloped or developed only minimally for its recreational and other natural resource values? (That course of action, though less desirable in our judgment, would at least minimize the impact on the fragile desert biome.)

RESPONSE: Alternatives to the proposed action (sale to the State of Nevada) contain possible actions similar to the above suggestions. These alternatives, as stated in the Final Environmental Statement, included: (1) retention of the Colorado River floodplain in public ownership (Alternative C), no action, (2) retain the land in Federal ownership (Alternative D), and (3) develop as a public recreation area (Alternative F).

EDITORIAL

COMMENT 19A-1:

On pages 12 and 13 under the heading of "Mitigating Measures Included the Proposed Action", we have assumed that "Colorado River Council" should be Nevada Division of Colorado River Resources. Our comments provided in our April 8 memo are based on this change. We have no knowledge of an organization involved in the Fort Mohave lands with the name of Colorado River Council.

RESPONSE: "Colorado River Council" has been changed to read "Nevada Division of Colorado River Resources."

COMMENT 19-10:

Page 21, map. Concentration Point 8 not shown on map. The map is of such a scale to be of little value in determining limits of flood hazards.

RESPONSE: Concentration Point No. 8 has been added to the Flood Hazards Map. Additional labels on the map have been included to show the limits of the 100-year flood and the location of the levee.

COMMENT 19A-11, -13, and -15:

Page 30, p. 2. Change November 32, 1976 to November 23, 1976 (?) Errata Sheet indicates changes to pass 27, 29, 32, 34, 38, 40, 41, 44, 47, 49, 51, 52, 54, 56, 61, 62, 63. There are no such pages included in the draft supplement.

Page 38 (P 20) (p 22) Plate 20 not included or identified

Page 41 (pages 27 through 64) not included?

RESPONSE: As stated in the Description of the Environment Section of this Supplement, p. 7 , the site-specific portions of the Cultural Resources Inventories (Appendix D) have not been included. The complete Reports are available for review at the Bureau of Land Management's Nevada State Office in Reno.

COMMENT 19-12:

Page 37, map, should indicate land areas already purchased by the State, those reserved by the Bureau of Reclamation, and those in private ownership.

RESPONSE: These land areas are adequately shown in the Final Environmental Statement, to which this Supplement has been referenced and is a part thereof.

COMMENT 19A-14:

Page 41 (P25) The contract between NAS and BLM should be included because of repeated reference as to methods, requirements, etc.

RESPONSE: The contract will not be included in this document, as it will not add to the resource data of the area and would serve no purpose in the environmental process.

COMMENT 19-16:

Page 42 (p. 67) Site 26 Ck 1413 not identified on pages 45 or 46?

RESPONSE: This particular site was inventoried during the field survey and was determined to be on private land and not on lands being analyzed under this proposal. The land ownership is so stated in the report.

COMMENT 19-17:

Page 42 and 43 Rearrange (pages 71 and 70). (Page 72) missing?

RESPONSE: It is noted in the report that page 72 was a duplicate of a following page and it was deleted from the report. Corrections have been made, and where pages have been intentionally deleted from the various reports this has been indicated.

LEGAL/PROCEDURAL-SECTION 7, FISH AND WILDLIFE COORDINATION

COMMENT 13-1:

While we do not take issue with the substance of the reports, we are concerned about the procedure followed by the Bureau in this instance. Accordingly, we wish to take this opportunity to comment on the inadequacies of the approach in the hope that, in future cases, the Bureau will comply with the procedural requirement imposed by Section 7 as well as with its substantive mandates.

As our March 13, 1975 comments on the final environmental impact statement (EIS) on the transfer of the Fort Mohave Lands made clear, Section 7 imposes a non-discretionary obligation on all federal agencies to consult with, and obtain the assistance of the Fish and Wildlife Service (F&WS) in any case in which a proposed action may reasonably be expected to result in adverse impacts to protected species or their habitats. The final statement on its face revealed that such impacts were likely to result if the proposed transfer were implemented. (See, e.g., pp. 100-101 of the Final EIS.) Yet, it failed to demonstrate that the BLM had complied with Section 7's consultation requirement. Under these circumstances, therefore, it was clear that the Bureau was required to formally request the initiation of consultation with the F&WS. (Cf. FWS, "Guidelines to Assist Federal Agencies in Complying with Section 7 of the Endangered Species Act of 1973" (April, 1976); Proposed Regulations for Interagency Cooperation Pursuant to Section 7 of the Endangered Species Act of 1973, 42 Fed. Reg. 4868 (Jan. 26, 1977).

Instead of requesting the assistance of the F&WS, however, the Bureau chose to conduct, on its own, additional studies of the Fort Mohave lands and their value for the identified endangered species. We submit that this approach was patently incorrect at the time it was undertaken. Section 7 mandates interagency consultation, not just further independent agency screening and analysis, whenever there is reason to believe that protected species or their habitats may be affected by a proposed action or program.

RESPONSE: The Nevada Fish and Game Department and the Fish and Wildlife Service were notified and consulted with prior to the field inventory for threatened or endangered wildlife species. Consultation was made with the Office of Endangered Species, Fish and Wildlife Service, in regard to threatened or endangered plant species. The Nevada Fish and Game and the Fish and Wildlife Service in comment letters 019B and 010 state that the Draft Supplement adequately discusses the subjects which fall within their areas of jurisdiction.

LEGAL/PROCEDURAL-FEDERAL LAND POLICY AND MANAGEMENT ACT OF 1976

COMMENT 29-1:

There seem to be two main issues at stake: first, and most important, should the 9,000 acre Fort Mohave tract be transferred to the State of Nevada as authorized by the earlier statutes dating back to the 60's or should it remain in federal ownership pursuant to the national policy established by the Federal Land Policy and Management Act of 1976?

RESPONSE: The Federal Land Policy and Management Act of 1976, Public Law 94-579 (90 Stat. 2787), states in Section 701(f) that: "Nothing in this Act shall be deemed to repeal any existing law by implication."

The Fort Mohave Act of April 22, 1960, as amended, Public Law 86-433, was not repealed by the Federal Land Policy and Management Act of 1976, and therefore is still in effect.

COMMENT 16-1:

The second area of my concern involved the way in which your "Cultural Resource Inventory" handled evaluation of archeological and historical properties identified during the survey-sampling done by the Nevada Archeological Survey. Evidently that survey was done "at BLM clearance level, Class 3, Intensive Survey in accordance with the Nevada BLM Information Memorandum No. NSO 76-59 (N-930.41)," (EIS supplement, p. 31) and "all sites were evaluated by the BLM Cultural Resource Evaluation System (CRES) in the field to determine their cultural significance" (EIS supplement, p. 41). The five rating codes of CRES are found on pages 7-9 of the same document. These rating codes were evidently applied to determine if a site met the criteria for nomination to the National Register of Historic Places under 36 CFR 800.10. However, the CRES rating codes bear no resemblance to the National Register crtieria. Only if an individual site was determined to rank at "Level S-1," was it considered to be of National Register caliber.

The obvious question here is why weren't the National Register Criteria themselves directly applied as mandated in 36 CFR 800.4, instead of interposing an alien set of CRES criteria? The resultant situation is untenably topsy-turvy: CRES criteria are used to determine National Register criteria. Consequently, your entire evaluation procedure becomes a pointless and illegal non sequitir. You have not even begun to comply with 36 CFR 800. This failure is not the fault of the archeologists you employed: your own contract instructions are to blame. Nevada Archeological Survey provided you with sound data, but your inept CRES criteria made it impossible to properly and legally evaluate that data.

RESPONSE: The use of a system for evaluating the relative significance of cultural resources is absolutely essential to a multiple-use agency such as the Bureau of Land Management if that agency is to properly plan for, and subsequently manage, this resource base. The Bureau of Land Management in Nevada developed the Cultural Resources Evaluation System (CRES) in consultation with personnel of the Nevada Archaeological Survey to accomplish this end. This system was especially designed to address the area of archaeological properties to complement 36 CFR 800 procedures in an area that is left extremely vague by those procedures. However, the BLM does recognize that, at least for the present, we will be unable to use CRES as a means for assessing the potential eligibility of a cultural resource property for inclusion in the National Register of Historic Places. This in the light of the all-encompassing nature of criteria (4) under 36 CFR 800.10, which states that a property may be considered eligible simply on the grounds that it may yield "information important in prehistory or history." The BLM has consulted with the Nevada State Historic Preservation Officer and the President's Advisory Council on Historic Preservation. (See Appendix E, p. E-1.)

COMMENT 16-2:

My third area of concern is that, although the numerous lithic quarry sites recorded in the sampling-survey were found to follow the availability of lithic materials on the second ancient river terrace, the entire sweep of sites along that terrace was not considered as a single archeological district. The integral relation of all sites along this ancient terrace of river cobbles makes it an obvious archeological district (36 CFR 800.10). Considering each site as an isolated individual ignores this fact, and makes impossible the proper application of the National Register criteria. As a district, it would be my judgment that this entire site-complex meets criteria #4 for nomination to the National Register of Historic Places (36 CFR 800.10). We have a similar situation at the preferred site of the Sundesert Nuclear Plant on the Palo Verde Mesa south of Blythe, California, where a very similar lithic assemblage has been found to meet criteria #4. I would refer you to the testimony of Jay von Werlhof before the State Energy Resources Conservation and Development Commission on this very point, and to Mr. von Werlhof's "Archeological Investigations of the Sundesert Nuclear Site."

RESPONSE: See Response to Comment 16-1 above and the second Cultural Resources Inventory Report, Appendix D, p. D-11.

APPENDIX A

ENDANGERED SPECIES ACT COMPLIANCE REPORT: VEGETATION

On June B, 9, and 10, Messrs. Wilson, Kinsinger and Pfeiffer made numerous traverses of the Sale Area by vehicle and on foot. The Sale Area consists of one large area of approximately 9,000 acres and two small isolated tracts lying north of the large area. (See Appendix 1 for a list of major plant species encountered). (See Appendix 2 for a series of 3Smm photographs of the area.)

The main segment of the Fort Mohave Land Sale area is composed of two major land forms. Sandy and silty soils occur in the old meanders of the Colorado River up to an elevation of approximately S20 feet msl. The remaining land form, the bajada or outwash plain, rises in a northwesterly direction to approximately 1,S60 feet msl in the northwest corner of Section 1, T33S, R6SE.

The land adjacent to the river is interpersed with dikes and roads. The sand dune areas are dominated by bush or alkali aster with a few scattered willows. Honey mesquite, screwbean mesquite, salt ceder, brittlebush, rayless brittlebush, arrow-weed, Russian thistle, fleabane, annual buckwheats, and six weeks fescue occur in the more silty and gravelly areas. Creosotebush occurs very sparingly in this type and cattail is in almost pure stands in the pond areas.

The bajada is composed primarily of granitic derived soils with a few gravelly island remnants of an earlier surface. One major wash dissects the bajada in Sections 24 and 2S, T33S, R6SE, and Sections 19 and 30, T33S, R66E. Creosotebush is the dominant species, occurring in an almost pure stand at bajada base but interspersed with numerous species on the upper bajada. Other species include bursage, catclaw, cheesebush, sweetbush, white ratany, Anderson wolfberry, Cooper wolfberry, silver cholla, bladdersage, cattle spinach and rock nettle. Smoke tree and desert willow occurs only in the major wash. Beavertail cactus, barrel cactus and rigid spiny herb were found on the gravelly island remnants. Scattered galleta occurs at about 1,400 feet and above. Two decadent Mohave yuccas were observed in the northwest portion of the sale area. Herbaceous species in the area include annual buckwheats, sandmat, plantain, russian thistle, gourd, ground cherry, white-stemmed milkweed, rambling milkweed, desert croton, six weeks fescue and sand verbena.

The small isolated tract (circa 20 acres) in Section 32, T32S, R66E is composed of a desert riparian community adjacent to and east of State Highway 76 and dissected granite to the west of the highway. Tamarix and arrowweed are dominants in the desert riparian area. Creosotebush, brittlebush, rayless brittlebush, diamond cholla, silver cholla, beavertail cactus, bursage, white ratany and catclaw are the predominant species on the granite area but occur sparingly. A few honey mesquite trees were found at the entrances to side canyons. Five hedgehog cactus plants were located on north-facing canyon slopes.

The larger isolated tract (circa B0 acres) occurs in Section 29, T32N, R32N, R66E. The desert riparian community occurs south of State Highway 76. An old sand pit, rock quarry and electricity substation dominates the southern portion of the area north of the highway. Annual buckwheats occur on this area. Species composition was similar to that found on the smaller tract.

A literature search, herbaria search, and an on-site survey was performed. The Federal Register, Vol. 40, No. 127, dated July 1, 1975 lists 127 endangered or threatened plant species in Nevada. In addition, Or. Hugo Mozingo, Chairman, Oepartment of Biology, University of Nevada Reno, provided a listing of 21 species being nominated by the Northern Nevada Native Plant Society.

Or. Oavid Wilson, Plant Ecologist-Botanist, Oenver Service Center, screened the lists by a literature search of Tidestrom's *Flora of Nevada*, Munz's *A California Flora* and supplement thereto, Kearney and Peeble's *Flora of Arizona*, Benson's *The Native Cacti of California*, Bradley and Oeacon's *The Biotic Communities of Southern Nevada* and Holmgren and Reveal's *Checklist of the Vascular Plants of the Intermountain Region*.

A similar search was conducted for Federal Register species with occurrence in San Bernardino County, California and Mohave County, Arizona.

The list of possible species was reduced to 22. These were screened by herbaria searches by Dr. Wilson and Or. Floyd Kinsinger, Oenver Service Center, and Jack Pfeiffer, Las Vegas Oistrict Office at the Oepartment of Biology and the Oepartment of Renewable Natural Resources, University of Nevada Reno and at the Desert Research Institute, University of Nevada Las Vegas. The list of possibles was reduced to six. Of these, the following five were not accounted for: Asteraceae - *Machaeanthera ammophila*; Fabacae - *Astragalus musimonum*; Scrophulariaceae - *Penstemon decurvus*, *Penstemon nyeenis*, *Penstemon rubicundus*. These five species were subsequently deleted as possibles when Or. Wilson visited with Dr. Bruce MacBryde, Office of Endangered Species, Fish and Wildlife Service, Washington, O.C. From information in Dr. MacBryde's possession regarding elevation and other distribution criteria, it was determined that none of the five species occur in the land sale area.

The sixth species, *Ferocactus acanthodes* Britt. and Rose or *Echinocactus acanthodes* Lem., is on the proposed Northern Nevada Native Plant Society additions. (This species was not added to the proposed rulemaking list of approximately 1,700 native plant taxa to be Endangered Species in Part IV of the Federal Register, June 16, 1976.) This barrel cactus occurs sparingly in the land sale area. A review of pertinent Floras indicates that this species is found on rocky slopes and outwash fans, generally below 5,000 feet in San Oiego, Imperial, Riverside and San Bernardino Counties, California; Yuma County, Arizona; northeastern Baja, California; and northwestern Sonora, Mexico, therefore, the proposed action would not threaten the barrel cactus with extinction due to its relatively widespread occurrence outside the land sale area.

It is hereby concluded that there are no endangered or threatened plant species in the Fort Mohave Land Sale area.

Oavid G. Wilson
Plant Ecologist - Botanist

Appendix 1

MAJOR SPECIES
FORT MOHAVE LAND SALE AREA

SPECIES	COMMON NAME
Typhaceae	
Typha angustifolia	Cattail
Gramineae	
Festuca octoflora	Six weeks fescue
Hilaria jamesii	Galleta
Tridens pulchella	Fluffgrass
Agavaceae	
Yucca schidigera	Mohave yucca
Salicaceae	
Salix spp.	Willow
Loranthaceae	
Phoradendron californicum	Mistletoe
Polygonaceae	
Chorizanthe rigida	Rigid spiny herb
Eriogonum inflatum	Oesert trumpat
Eriogonum pusillum	Yellow turban
Eriogonum thomasii	Thomas buckwheat
Eriogonum spp	Wild buckwheats
Chenopodiaceae	
Atriplex polycarpa	Cattle spinach
Salsola kali	Russian thistle
Nyctaginaceae	
Abronia villosa	Hairy sand-verbena
Cruciferae	
Caulanthus cooperi	Cooper caulanthus
Lepidium spp	Mustards

SPECIES	COMMON NAME
Leguminosae (Fabaceae)	
Acacia greggii	Catclaw
Dalea spinosa	Smoketree
Krameria grayi	White ratany
Prosopis glandulosa var *torreyana*	Honey mesquite
Prosopis pubescens	Screwbean mesquite
Euphorbiaceae	
Croton californicus	Desert croton
Euphorbia polycarpa	Sandmat
Zygophyllaceae	
Larrea tridentata	Creosotebush
Tamaricaceae	
Tamarix chinensis	Salt cedar
Loasaceae	
Eucnide urens	Rock nettle
Cactaceae	
Echinocerus englemannii	Hedgehog cactus
Ferocactus acanthodes	Barrel cactus
Opuntia basilaris	Beavertail cactus
Opuntia echinocarpa	Silver cholla
Opuntia ramossima	Diamond cactus
Asclepidaceae	
Asclepias albicans	White-stemmed milkweed
Funastrum hirtellum	Rambling milkweed
Polemoniacea	
Gilia spp	Gilia
Hydrophyllaceae	
Phacelia crenulata	Notch-leaved phacelia
Boraginaceae	
Cryptantha spp	Forget-me-nots

SPECIES	COMMON NAME
Labiatae	
Hyptis emoryi	Desert lavendar
Salazaria mexicana	Bladdersaga
Salvia columbariae	Chia
Solanaceae	
Lycium andersonii	Anderson wildberry
Lycium cooperi	Cooper wolfberry
Physalis crassifolia	Ground cherry
Bignoniaceae	
Chilopsis linearis	Desert willow
Plantaginaceae	
Plantago insularis	Woolly plantain
Cucurbitaceae	
Cucurbita palmata	Gourd
Compositae	
Ambrosia dumosa	Bur sage
Aster carnosus	Alkali aster
Baileya pauciradiata	Lax-flower
Bebbia juncea	Sweetbush
Encelia farinosa	Brittlebush
Encelia frutescens	Rayless brittlebush
Erigeron spp	Fleabanes
Hymenoclea salsola	Cheesebush
Lygodesmia exigua	Egbertia
Palafoxia linearis	Spanish needle
Peucephyllum schottii	Desert fir
Pluchea sericea	Arrow-weed

APPENDIX B

ENDANGERED SPECIES ACT COMPLIANCE REPORT: WILDLIFE

Fort Mohave Land Sale:

Endangered Species Act Compliance Report

WILDLIFE

Filed: JUN 9 1976
Date

By: William A. Kennedy
William A. Kennedy, Team Leader

Team Members:

Dr. Richard R. Olendorff, Wildlife Management Biologist

Gary Ferrier, Wildlife Management Biologist

Osborne Casey, Fisheries Management Biologist

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  - 3. Topography
  - 4. Water
- B. Peregrine Falcon
  - 1. Climate
  - 2. Topography
  - 3. Water
- C. Yuma Clapper Rail
  - 1. Climate
  - 2. Vegetation
  - 3. Topography
  - 4. Water
- D. Brown Pelican
  - 1. Climate
  - 2. Vegetation
  - 3. Topography
  - 4. Water
- E. Colorado River Squawfish
  - 1. Climate
  - 2. Topography
  - 3. Water
- F. Woundfin
  - 1. Climate
  - 2. Topography
  - 3. Water

VI. Impacts of Proposed Action

- A. Bald Eagle, Peregrine Falcon, and Brown Pelican
- B. Yuma Clapper Rail
- C. Colorado River Squawfish and Woundfin

II. Mitigating Measures Under the Proposed Action

ppendix I - Literature Reviewed

ppendix II - Team Resumes

ppendix III - USGS Quadrangle of Area

ppendix IV - Aerial Photos - 1947, 1954, 1973

ppendix V - Photographs

I. Introduction

Under Public Law (P.L.) 86-433, approved April 22, 1960, amended April 26, 1963, 9,000 acres remain for transfer (sale) to the State of Nevada. In compliance with the Endangered Species Act of 1973 (P.L. 93-205), and as a direct result of an opinion rendered by the Department of the Interior's Associate Solicitor on February 9, 1976, it was determined that the transfer of the remaining land must be screened (analyzed and reviewed) for possible threatened or endangered species involvement. This Endangered Species Act Compliance Report is the result of that screening process.

The action remaining under P.L. 86-433, as amended, is described in an environmental impact statement (EIS) entitled "Final Environmental Statement for the Sale of Fort Mohave Lands to the State of Nevada" (FES 75-10) filed with the Council on Environmental Quality 1/23/75. On page 77a of this EIS several wildlife species considered to be endangered and possibly to occur within the remaining 9,000 acres were noted. Only six of those species listed on page 77a are officially determined by the Fish and Wildlife Service (FWS) as threatened or endangered. These are:

bald eagle	-	Maliaeetus leucocephalus leucocephalus;
peregrine falcon	-	Falco peregrinus anatum and Falco peregrinus tundrius;
Yuma clapper rail	-	Rallus longirostris yumanensis;
brown pelican	-	Pelecanus occidentalis;
Colorado River squawfish	-	Ptychocheilus lucius; and
woundfin	-	Plagopterus argentissimus.

II. Methods

An Endangered Species Screening Team was appointed to accomplish the following:

1. Evaluate the proposed action as it relates to endangered species;

2. Search existing files and pertinent literature for information (see appendix I).

3. Consult with outside experts, as necessary, including attendance at recovery team meetings for the peregrine falcon, Yuma clapper rail, and Colorado River squawfish;

4. Conduct an onsite inspection and any needed inventories of the land sale area; and

5. File an Endangered Species Act Compliance Report, including discussion of the possible impacts of the proposed action on endangered species, if any.

This Team was established on February 27, 1976, and completed its assignment as of the date of this Report.

The Team composition and species responsibilities were as follows:

Richard R. Olendorff	-	bald eagle, peregrine falcon;
Gary Ferrier	-	brown pelican, Yuma clapper rail;
Osborne Casey	-	woundfin, Colorado River squawfish; and
William A. Kennedy	-	Team Leader.

Each of the Team members is experienced and knowledgeable of the life histories and habitat requirements of the species assigned to him (see biography or resumé of Team members in appendix II of this Report). Mr. Ferrier is a member of the Yuma Clapper Rail Recovery Team.

The onsite inspection of the land sale area was conducted during the week of March 9-13, 1976. The FWS and the Nevada Department of Fish and Game were notified of the field inventory prior to the actual inventory and will be provided copies of this Report. The primary criterion used in the field inventory was presence or absence of habitat which could support any of the listed species on a permanent basis.

Over a period of 3 days, the area was traversed both on foot and by vehicle. The entire 9,000-acre tract was either seen or traveled. The only habitat which possibly satisfied the requirements of an endangered species included several small areas of cattails. These will be discussed later in this Report in sections dealing with the Yuma clapper rail. No endangered species were observed or heard.

An intensive inventory was carried out on April 19 and 20 and May 26 and 27 for the Yuma clapper rail using the standard call-count technique. This was necessary (1) to verify existence or nonexistence of the species during the nesting season, when they can be located most easily, and (2) to determine if vegetative growth (cattails or bulrush) had begun or if, due to lowering of the water table, this habitat type is still decreasing in extent. The results of this inventory show that there were no Yuma clapper rails on the sale area during the nesting season. The inventory also confirms the Team's general conclusion that the cattail habitat is still decreasing in extent because of lack of water.

III. General Observations of the Sale Area

The general condition of the land surrounding the sale area is as follows (additional description is provided in the EIS; see appendix III for USGS quadrangle of area):

North side: An electrical generating plant is sited within 3 miles of the sale area boundary. Recreational sites, motels, gaming houses, and some private residences line the river from the sale area to Davis Dam 8 miles north. To the northwest there are low rising hills which do not extend south into the sale area.

West side: For several miles due West is a continuation of the widely spaced desert shrub association of the alluvial fan. There is no apparent endangered species habitat to the West and, therefore, it is unlikely that adverse affects could occur offsite as a result of the sale and development of the Fort Mohave lands.

South side: The Mohave Indian Reservation borders the eastern half of the south side of the sale area. The California State line is on the west half. Land forms and habitats similar to the sale area continue to the South. No endangered species habitat is known to occur within 25 miles downstream of the sale area.

East side: The Colorado River is the boundary on the east side. On the Arizona side is a private residential housing development which extends intermittently from Davis Dam to Needles, California. This private development is interrupted periodically by commercial development. Many of these developments extend to the river's edge.

Channelization of the Colorado River along the sale area has caused most of the dominant vegetation on the flood plain to appear to be dead or in a decadent condition. The Team concluded that this vegetative condition was directly related to a lowered water table as a result of channelization. As discussed later in the Yuma clapper rail section on the "Description of Existing Habitat and Limiting Factors," the small amount (less than 10 acres) of cattails found adjacent to the river in the flood plain area was in a dried condition. This is not an uncommon condition in early March, but cattails are usually associated with sufficient aboveground water. There was only a small isolated puddle of water found around the base of the cattails to ensure their long-term future existence, although sufficient recharge could occur during the spring rainy period. This did not happen in 1976 as was revealed by the intensive inventory for Yuma clapper rails in April and May.

In comparing 1954 and 1973 aerial photos (appendix IV), it is apparent that there has been a drastic change in the availability of water within the flood plain. The 1954 photos show the Colorado River to be a meandering river spread across a flood plain approximately 2 to 2 1/2 miles wide. This resulted in a slow-flowing river with substantial quantities of water-loving plants. The 1973 photos show a straight, high-velocity river which has been channelized to allow the water to be contained within a strip less than one-eighth of a mile in width. The present river channel has dikes and levees along the entire sale area. These water conditions are not conducive to emergent plants, such as the cattails, and have lowered the water elevation due to river bottom erosion and lack of soil deposits.

IV. Habitat Requirements of Possible Endangered Species

A. Bald eagle (Maliaeetus leucocephalus leucocephalus)

1. Climate: The bald eagle is primarily a species which occupies coastal, lacustrine, and/or riparian habitats where annual rainfall is generally moderate to heavy (15 to 60 inches or more per year). The few pairs (probably less than 10) that nest in the arid southwestern United States are found in ecologically unique and instinctively traditional areas. One such area can be found along the Verde River near Phoenix, Arizona. Another, with a single pair of birds, is 25 miles south of the sale area on the Havasu National Wildlife Refuge. Arid regions support more wintering than nesting bald eagles, primarily at traditional roosts. The vast majority of the wintering bald eagles found in arid regions are the nonendangered northern subspecies (Haliaeetus leucocephalus alaskanus).

2. Vegetation. Bald eagle nesting and roosting habitats are characterized by tall trees found in both extensive forests and sparce or heavy riparian forests. With few exceptions, the species is an obligate tree nester, and its preferred roosts are in trees. Nests have been found on cliffs, but this is extremely rare. Vegetational characteristics other than trees are of little importance to bald eagles.

3. Topography. Bald eagles frequently roost in trees on the steep sides of valleys, usually overlooking a stream which supports an ample food supply. In flat country, riparian or lakeside forests are necessary both for nesting and roosting. Exceptional nests on cliffs require a vertical cliff face of moderate extent, e.g. 75-200 feet in height.

4. Water. The bald eagle is associated almost exclusively with aquatic ecosystems, both summer and winter. The main diet of this species is fish and carrion washed ashore. To a lesser degree the species' diet may consist of rabbits, other small mammals, and birds, but this type of food is mostly taken opportunistically. Exceptions to the bald eagle's strict affinity for water areas may occur where road-killed rabbits and other carrion are numerous enough to satisfy its daily food requirements.

B. Peregrine falcon (Falco peregrinus anatum and Falco peregrinus tundrius). There are two subspecies of peregrine falcons which are presently listed as endangered: the American peregrine falcon (F. p. anatum) and the Arctic peregrine falcon (F. p. tundrius). The American subspecies will be considered in this Report in relation to the possibility of its nesting on or near the sale area. The Arctic subspecies will be considered only as a possible spring and fall migrant through the area; its only nesting occurs further north in Canada and Alaska.

1. Climate. Peregrine falcons can be found in different subspecific forms in both arid and nonarid environments. They also inhabit numerous climatic situations between the two extremes. Thus the American peregrine falcon nests in a variety of climates with the inland mountain ranges of the Pacific Coast States and the arid regions of the Southwest being at the extremes. Even in the arid States, however, the American peregrine falcon is most commonly associated with isolated aquatic ecosystems as described below under IV.B.3 Water. The Arctic peregrine falcon nests only in northern Canada and Alaska, but migrates through numerous climates, including the arid Southwest, to and from its wintering grounds in South America.

2. Topography and Geology. The peregrine falcon is curiously restricted in its breeding habitats because of its inability to construct nests. All nesting requirements with regard to substrate must be supplied by a combination of land forms and geology. For example, a sheer cliff of a thousand feet is of no value to a peregrine falcon if the geological formation of the cliff has not created ledges or cavities which can be readily used for nesting. Similarly, the most fractured cavity-filled substrate is not adequate if there are no vertical cliff faces of sufficient height. Hickey and Anderson (1969:11) described the peregrine falcon nesting requirement as follows: "cliffs are by far the peregrine's favorite type of nesting site, and its often complete dependence on them seems to have prevented breeding of the peregrine in some regions."

3. Water. The vast majority of peregrine falcons are found in association with water where they habitually prey on aquatic birds, such as waterfowl and shore birds. This is an important though not obligate situation. Ideal topographical and geologic conditions may at times attract nesting peregrines to areas where they feed on pigeons or upland birds.

Of particular importance is the presence or absence of numerous small open water areas, such as sloughs, ponds, lakes, etc. This results in considerable movement of water birds over land in their travels from one feeding or resting area to another. Large bodies of water, such as the channelized Colorado River, are sanctuaries for ducks and shore birds. Unless a peregrine falcon can regularly pursue its prey over land, the habitat requirements for food may not be met, and the species may be restricted from the area.

C. Yuma clapper rail (Rallus longirostris yumanensis)

1. Climate. In the United States the Yuma clapper rail is found only in riparian habitat associated with an arid desert environment. Annual rainfall generally ranges from 3 to 10 inches, and the relative humidity averages about 25 percent. Summers are long and hot with approximately 100 days over 100° F. The winters are relatively short and mild. In the northernmost portions of its range, freezing temperatures occur an average of 65 days per year, but snow is extremely rare. The mean annual temperature is 72° F.

2. Vegetation. The 1973 and 1974 population surveys made by the Yuma Clapper Rail Recovery Team reveal that the species inhabits only the cattail and bulrush vegetative type within its distributional range in the U.S. These studies also reveal the frequency of occupation in relation to the size of the habitat areas as follows:

Size of Habitat Area	Percent Use/Occupancy
10 acres or less	Less than 20 percent
20-30 acres	57 percent
Larger than 30 acres	More than 80 percent

Smith (1974) found the highest densities of rails in relatively light cattail stands, and the lowest rail densities in dense cattail stands. Territory size averages almost 4 acres.

3. Topography. The vast majority of cattail and bulrush riparian vegetation within the distributional range of the Yuma clapper rail is located within the flood plain of the Colorado River. The species requires strips of high ground, or small islands, with gentle slopes angling upward from the water surface (Smith 1973).

4. Water. The Yuma clapper rail prefers either of two types of water surfaces: (a) water which flows through many small channels 2 to 10 feet wide, either canopied with vegetation or open; and (b) small bodies of open water 0.05 to 0.5 acres in size, either separated or interspersed with the smaller channels.

The rails prefer these types of water surfaces, together with the emergent vegetative type in a contiguous area larger than 30 acres in size. The water depth must generally be less than 1 foot, with little or no daily fluctuation.

D. Brown pelican (Pelecanus occidentalis)

1. Climate. The brown pelican of the Southwest prefers a relatively cool and humid climate with a mean annual temperature of about 64° F, where maximum temperatures seldom reach 100° F, and freezing temperatures are unknown. Rainfall may only be about 10 inches per year, but relative humidity averages 65 percent.

2. Vegetation. Low shrubs are commonly utilized for nesting, although small scattered trees may be present on some rocky nesting islands (Bent 1922). Broad sandy beaches are generally devoid of vegetation.

3. Topography. Preferred topography consists of broad sandy beaches and the endless ocean panorama. Large rocky islands with cliffs and steep slopes are required for nesting.

4. Water. Coastal ocean waters and pronounced tides, waves, currents, and wide-open spaces are preferred.

E. Colorado River squawfish (Ptychocheilus lucius)

1. Climate. The Colorado River squawfish can only be found where daily air temperatures are sufficiently high to maintain water temperature above 21.5° C. A mimimum water temperature of 21.5° C is required for spawning and reproduction (Vanicek and Kiamer 1969). Although this minimum has been determined sufficient, it is not considered optimum.

2. Topography. Colorado River squawfish prefer meandering larger rivers, where the current is typically strong, with bottoms of mud, stones, and sand.

3. Water. This species prefers muddy water above 21.5° C for spawning.

Habitat requirements of this fish are sketchy in the literature. It does not appear to be able to adapt to rapid changes in environmental conditions and, therefore, is greatly reduced in distribution and abundance throughout its former range.

F. Woundfin (Plagopterus argentissimus). The woundfin is presently limited in population distribution to the Virgin River below La Verkin, Utah, and one of its tributaries (Cross 1975).

1. Climate. No specific data on climatic requirements are available. This primarily is due to climate not being as critical a component of the habitat requirements of the woundfin as are the other factors described below.

2. Topography. The woundfin can be found associated with rivers with sand bottoms and turbid water.

3. Water. The Virgin River, where the woundfin is found, has turbid water which transports large quantities of silt and clay sized particles in suspension and sand sized sediments as bedload, imparting a characteristic muddy brown color to the water. Cross (1975) collected woundfin in water temperatures varying from 10° to 35.5° C with a mean value of 23.7° C. Water velocities varied from zero to 1.13 m/sec. with a mean value of 0.42 m/sec.

Woundfin distribution, within its Virgin River environment, is determined by substrate and turbidity (considering the coloration and morphology of the woundfin). It is mostly associated with a sand bottom and a high concentration of suspended solids.

V. Existing Habitat and Limiting Factors of Possible Endangered Species.

A. Southern bald eagle

1. Climate. In the arid southwestern U.S. the bald eagle is at the extreme southern periphery of its range. The bald eagle is a water-loving species not especially suited for such harsh, dry climates. Thus climate, which is unrelated to the proposed action, is an extremely important limiting factor of the bald eagle in and adjacent to the Fort Mohave land sale. In fact, there has been no reported nesting of bald eagles in Nevada for many years, although there is a report of an active nest on the Lake Havasu National Wildlife Refuge in Arizona 25 miles south of the sale area.

2. Vegetation. There are no large trees, such as cottonwoods, on the subject Fort Mohave lands. This one fact alone makes the area poor habitat both for nesting and wintering bald eagles. There are two small groves of trees south of the proposed sale area on the Fort Mohave Indian Reservation, but most such trees along the Colorado River between Davis Dam and the California State line are not sufficiently secluded from residential development or recreational access to provide good roosts. Of all existing habitat conditions, this absence of acceptable riparian trees is probably the most important factor that, for all practical purposes, precludes use of the area by bald eagles.

3. Topography. Even if cliff-nesting bald eagles were common, there are no cliffs of adequate vertical extent on the sale area to attract the birds. In addition, there are no steep forested hillsides which overlook the sale area where bald eagles might roost. The flat flood plain with virtually no roosts is also unacceptable. Topographically, the sale area and surrounding terrain are not suitable bald eagle habitat.

4. Water. The Colorado River, specifically its abundant fish populations (especially carp), is the only positive ecological factor which might attract bald eagles. However, this ample supply of food is virtually unavailable to eagles because the absence of nest sites, roost trees, and hunting perches is an overriding ecological deficiency.

B. Peregrine falcon

1. Climate. The arid environment of the subject Fort Mohave lands is a limiting factor neither to nesting by the American peregrine falcon nor to use during migration by the Arctic peregrine falcon.

2. Topography. There are no cliffs on the Fort Mohave sale lands. The only significant relief occurs as abrupt but not vertical dirt and gravel banks 30-50 feet high between the flood plain and the alluvium. With regard to nesting of the American peregrine falcon, neither the topography nor the geology is satisfactory. Thus these factors are limiting.

3. Water. There is ample water in the Colorado River to attract either nesting or migrating peregrine falcons, but channelization has provided virtual sanctuary to the peregrine's prey. Small areas of open water, such as were present on the 1947 aerial photos prior to channelization, are now dried up and filled with what appears to be dead or dying cattails. Without these open water areas ducks and shore birds, the preferred prey, are confined to the river channel. Here, aerial pursuit--the peregrine falcon's preferred method of hunting--goes largely unrewarded. The prey merely dive to safety in the water ahead of a pursuing falcon.

For this reason availability of prey is a likely limiting factor on the Fort Mohave lands both with regard to nesting of American peregrine falcons and to use on migration by Arctic peregrine falcons.

C. Yuma clapper rail

1. Climate. Suitable.

2. Vegetation. Aerial photos from 1967 indicate the presence of approximately 14 acres of cattails on the sale area. Earlier aerial photos taken before, and immediately after, channelization show extensive backwaters, ponds, and channels throughout the sale area portion of the flood plain. The 1973 aerial photos show there are 7.2 acres of the required cattail habitat type within the land sale area. It exists in the form of five separated and isolated pockets ranging in size from about three-quarters of an acre up to slightly less than 3 acres. In view of the preferences exhibited throughout its range for habitat areas in excess of 20 acres in size, the significance of these cattail pockets to the Yuma clapper rail is nil.

The fate of these areas has already been sealed with the system of levee roads, river (water) management priorities, and resultant successional changes already occurring in the area. The April and May surveys showed these areas to be essentially dry. While other cattail areas in the region outside the sale area were a bright green, this site still had a dead and dying brown color aspect. Growing cattails were difficult to find on the sale area.

In view of these changes, it is reasonable to assume that the small remaining cattail areas will soon be lost irrespective of and unrelated to the Fort Mohave land sale.

3. Topography. The cattail areas lie within the flood plain of the Colorado River. However, they have been isolated by channelization and levee construction. They remain today as shallow depressions surrounded by unstable drifting sandy soil which is obviously encroaching rather rapidly.

4. Water. Each of the cattail areas was visually examined. Except for a spot of damp soil, or small puddle, each area was essentially dry. The nearby river channel may fluctuate as much as 7 feet daily, but this does not provide recharge of the cattail areas.

D. Brown pelican

1. Climate. The Fort Mohave sale area is located within a hot, arid desert environment. The mean annual temperature is 72° F. Approximately 100 days per year exceed 100° F, and freezing temperatures occur about 65 days. The average annual rainfall is 6 inches, and relative humidity is 25 percent. These climatic factors are not characteristic of preferred brown pelican habitat.

2. Vegetation. Dominant flood plain vegetation generally consists of salt cedar, mesquite, and arrowweed. Alluvium vegetation is primarily a widely spaced desert shrub association dominated by creosote and burro bush.

3. Topography. The Colorado River flood plain and an alluvial fan dominate the topography in the sale area. The river is contained within a manmade channel along the eastern edge of the sale area, as well as a major portion of its length below the sale. This channel is approximately 240 feet wide and is bordered by steep riprapped rock levees. Sandbars are available for resting, but they occur only temporarily and irregularly. There are no perches available for brown pelican resting or socializing. Suitable islands do not exist. Therefore, the sale area and the river topography are not representative of brown pelican habitat.

4. Water. The Colorado River does not possess water characteristics preferred by the brown pelican. The riverflow is contained within a relatively narrow channel, and mechanical control may cause rapid fluctuations in the high waterline of as much as 7 feet.

E. Colorado River squawfish

1. Climate. Suitable.

2. Topography. The building of dams, changing the Colorado River into large reservoir lakes, e.g. Mead and Mohave along the Nevada border, eliminated the Colorado River squawfish in Nevada (La Rivers 1962). Aerial photos of the river adjacent to the Fort Mohave land sale in 1947 and 1954 show considerable physical differences from the conditions which exist today. A dike was constructed during the 1960's on the Nevada side of the river which extends along the sale area. The dike is 9 miles in length extending from the California State line northward to sec. 5, T. 33 S., R. 66 E., of the Mount Diablo meridian. Along the sale area boundary there is approximately one-quarter of a mile of the river which is not contained by a dike.

Prior to the construction of the dike and dredging of the river channel, the river was braided into many small shallow meandering water courses. The river gradient, as determined from the 1970 USGS 15-minute quadrangle maps, averages 1.5 feet per mile from the tristate corner -- Nevada, California, and Arizona -- upstream to the gaging station in the southwest corner of sec. 4, T. 33 S., R. 66 E., of the Mount Diablo meridian. This is a very flat gradient and explains why the flood plain was so wide before the river was altered. Under natural conditions the river was 1/4 to 1/2 mile in width throughout most of the area. The river presently varies in width from 200 to 400 feet with an average width of 240 feet.

The riverbed is composed of silt, sand, and small gravel to boulder-size rock. Much of the riverbed is sand from decomposed granite. The sand is very sterile as far as fish habitat and aquatic insects are concerned. In addition, the sand is constantly moving downstream, and the elevation of the riverbed is eroding down (a natural situation when channelization and increase in stream velocity have occurred). The constricting dikes causing higher water velocity, combined with the increased water releases from Davis Dam for power peaking, have accelerated the erosion. Side ponds, within the former flood plain, are now dry because of this lowering of the water table.

3. *Water*. Water releases below Davis Dam have greatly altered the habitat. The water quality has been changed, especially in regard to temperature and suspended solids. The Colorado River, along the sale and adjacent river areas, presently is clear and contains suspended solids (turbidity) only when Lake Mohave is drawn down. The frequent 7-foot daily fluctuation in water levels would also have considerable impact on certain species of fish. Water temperatures in the river have also been altered. The maximum water temperature of Davis Dam was 21.5° C with a mean temperature of 15.3° C. The river temperatures at Topock, on the Arizona side of the river approximately 10 miles below the sale area, were 22° C maximum with a mean of 16.4° C. Squawfish would not be able to spawn unless river temperatures remain above 21.1° C.

The exact date of the disappearance of the Colorado River squawfish below Davis Dam is not known. The combination of fluctuating water levels, reduced turbidity, lower water temperatures, and channelization all influenced the fish populations in the river. Introduced exotic species, such as stripped bass, channel catfish, and rainbow trout, may have had some effect also. The low gradient of 1.5 feet per mile indicates that the river in this area was poor squawfish habitat even before the dams were constructed.

F. Woundfin

1. *Climate*. Suitable.

2. *Topography*. See Section V.E.2 of this Report under squawfish.

3. *Water*. See Section V.E.3 of this Report under squawfish.

The woundfin is not present in the Colorado River below Davis Dam and could not be established by introduction because the habitat is not suitable. Water temperatures are well below the range preferred by woundfin. The clear water in the Colorado River also makes it unsuitable for woundfin. The mean water temperature of 23.7° C reported for woundfin habitat is 2.2° C higher than the maximum 21.5° C reported for the Colorado River below Davis Dam.

VI. *Impacts of the Proposed Action*

A. Bald eagle, peregrine falcon, and brown pelican. The proposed sale of Fort Mohave lands will not jeopardize the continued existence of the bald eagle, peregrine falcon, or brown pelican. In addition, the critical habitat issue is irrelevant with regard to these species because their presence on the Fort Mohave lands is highly unlikely or, at most, sporadic. Furthermore, because of the total lack of suitable topography, vegetation, roosting, and nesting sites, and because of the impracticability of a reversal of channelization of the Colorado River, the Fort Mohave sale lands are not likely ever to be critical habitat for the bald eagle, peregrine falcon, or the brown pelican.

B. Yuma clapper rail. Under the present conditions, as described, there is little, if any, suitable habitat remaining for this species. Furthermore, there probably will be little or no such habitat in the future, with or without the proposed action. There have been no authenticated observations of Yuma clapper rails within the Fort Mohave land sale area. The 7.2 acres of possible habitat within the area meet the habitat requirements of the rail only in that it occurs within an acceptable range of climate, and consists of a preferred vegetative type. Characteristics of the vegetation, such as its density of growth, size, location, and water component, do not fulfill the habitat requirements of the clapper rail. Mitigating measures, as described in section VII of this Report, may create new and better quality habitat and encourage Yuma clapper rail population growth and expansion. Implementation of the proposed action will in no way cause an adverse impact on the species.

C. Colorado River squawfish and woundfin. The proposed action would have no impact, either positive or negative, on any threatened or endangered fish.

VII. *Mitigating Measures Under the Proposed Action*

The lack of suitable habitat and the relatively low potential for developing such habitat for any species other than the Yuma clapper rail are obvious from the material presented. Therefore, the only mitigating measure offered below is for the Yuma clapper rail. It is offered even though present habitat conditions are in a declining state.

The proposed action details plans for significant acreage of off-river water developments. If cattails are planted or become established along the shoreline of these developments, Yuma clapper rails will likely use them if and when they expand their present distributional range northward. Residential and marina developments will likely be acceptable to them as long as potential establishment of cattails is permitted. An area that supports one of the greatest densities of Yuma clapper rails, 225 miles south of the sale area, also simultaneously supports one of the most active levels of intense recreational use along the entire length of the river (powerboating, water skiing, swimming, and fishing).

Literature Reviewed (Limited to those references most applicable to the Fort Mohave area).

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* Peregrine falcon

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* Yuma clapper rail

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Ohmart, R. D., and R. W. Smith. 1973. North American clapper rail (*Rallus longirostris*) literature survey with special consideration being given to the past and current status of *yumanensis*. Completion Rep. Bur. Reclamation Contract No. 14-06-300-2409.

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* Brown pelican

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Lawson, C. S. 1973. Notes on Pelecaniformes in Nevada. *Western Birds* 4:23-30.

McCaskie, G. 1970. The occurrences of four species of Pelecaniformes in the Southwestern United States. *Calif. Birds* 1(4).

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Sigler, W. F., and R. R. Miller. 1963. *Fishes of Utah*. Salt Lake City: Utah State Dept. Fish and Game.

Vanicek, C. D., and R. M. Kramer. 1969. Life history of the Colorado squawfish, *Ptychocheilus lucius*, and the Colorado chub, *Gila robusta*, in the Green River in Dinosaur National Monument, 1964-1966. *Trans. Amer. Fish. Soc.* 98(2):193-208.

APPENDIX C

FLOOD HAZARDS EVALUATION FOR THE FORT MOHAVE LANDS

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT, CORPS OF ENGINEERS
P. O. BOX 2711
LOS ANGELES, CALIFORNIA 90053

SPLED-WF

7 September 1976

Mr. John Trimmer
Bureau of Land Management
U. S. Department of Interior
300 Booth Street
Reno, Nevada 89502

Dear Mr. Trimmer:

Reference is made to your letter of 26 April 1976 requesting a flood hazard evaluation for the Fort Mohave lands, north of the Fort Mohave Indian Reservation.

The entire area is subject to shallow sheet flow. Inclosed is a map showing probable overflow limits, but because of the meandering of the streams flowing into the Colorado River, these limits are tentative at best. The areas indicated by the B_{12} zone are subject to shallow flows from the 100-year-frequency flood with depths varying generally from 6 to 12 inches. Those indicated by the B_6 zone are subject to shallow sheet flow with depths generally less than 6 inches.

Also inclosed is a chart showing the concentration points with respective peak discharges for the Standard Project Flood, the 100-year, 50-year and 25-year-frequency floods.

Based on preliminary studies by this office, it is estimated that peak discharges for the Colorado River at this point are 40,000 cfs for 50-year and 25-year floods. The Standard Project Flood is estimated to be 74,000 cfs. The levee constructed along the Colorado River is designed to pass 50,000 cfs. The overflows along the Colorado River are designated as A Zone on the inclosed map.

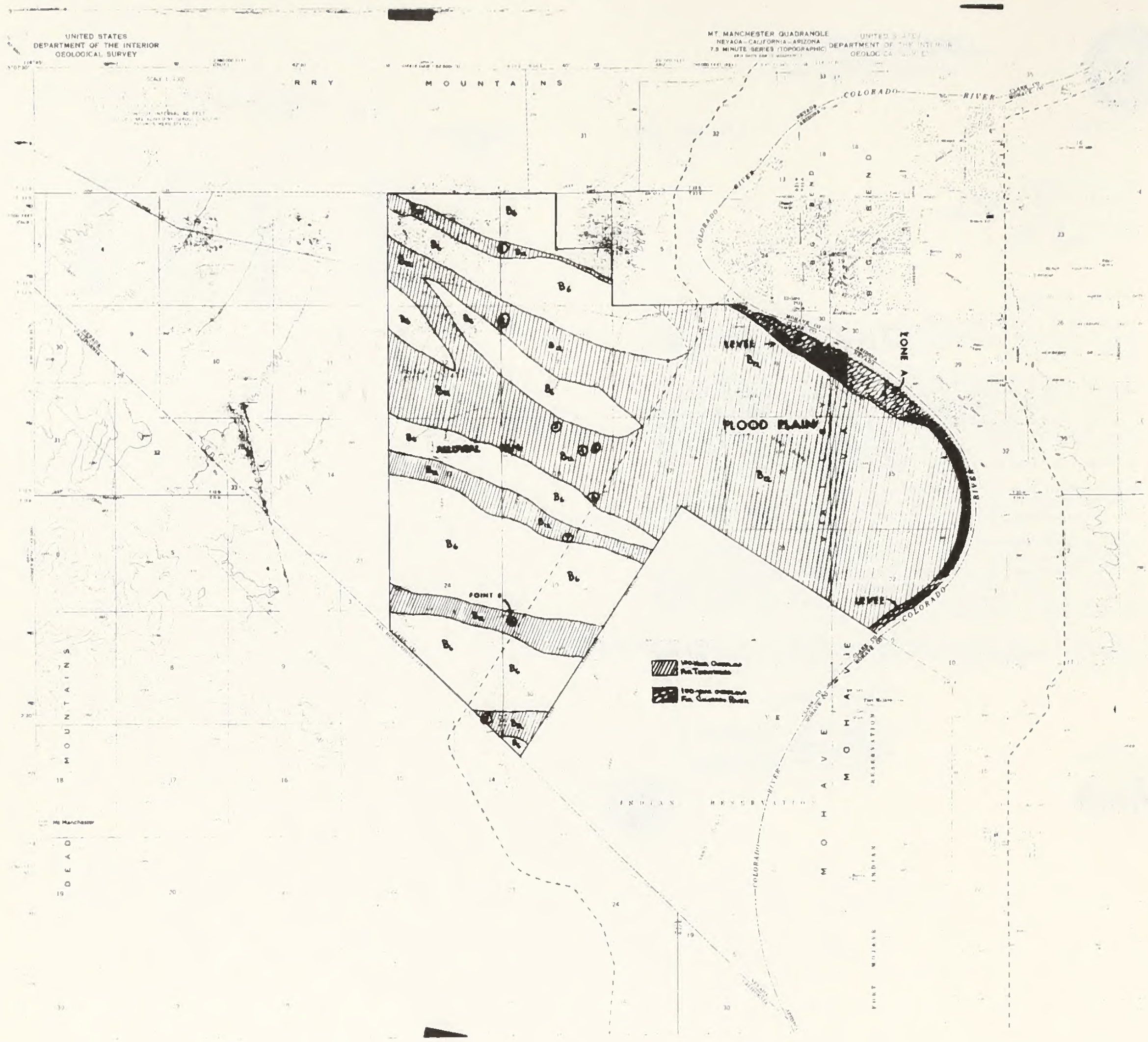
If we can be of any further assistance, please contact Mr. Terry Wotherspoon, Flood Plain Management Section, (213) 688-5420, and refer to File No. N-01-142.

Sincerely yours,

Garth A. Fuquay
GARTH A. FUQUAY
Chief, Engineering Division

2 Incl
As stated

Concentration Point	Discharge in cfs 25 yr.	50 yr.	100 yr.	SPF
1	750	1,200	1,800	4,300
2	950	1,500	2,200	5,300
3	550	900	1,300	3,100
4	700	1,100	1,600	3,900
5	900	1,400	2,000	4,900
6	400	650	900	2,200
7	700	1,100	1,600	3,900
8	2,000	3,200	4,600	11,000
9	900	1,400	2,100	5,000


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
MT. MANCHESTER QUADRANGLE
NEVADA–CALIFORNIA–ARIZONA
7.5 MINUTE SERIES (TOPOGRAPHIC)
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
RRY MOUNTAINS
COLORADO RIVER
BIG BEND
LEVEE
ZONE A
FLOOD PLAIN
ALLUVIAL FAN
POINT B
B6
Ba
100-Year Overflow For Tributaries
100-Year Overflow For Colorado River
INDIAN RESERVATION
MOHAVE
FORT MOJAVE INDIAN RESERVATION
DEAD MOUNTAINS
Mt Manchester

APPENDIX D

THE FORT MOHAVE CULTURAL RESOURCES INVENTORIES (AUGUST 1976 AND OCTOBER 1977)

THE FORT MOJAVE CULTURAL RESOURCE INVENTORY,

AN ARCHAEOLOGICAL/HISTORICAL FIELD INVESTIGATION

IN SOUTHERN CLARK COUNTY, NEVADA

August, 1976

Prepared for the Bureau of Land Management

Las Vegas District Office, Las Vegas, Nevada

P.O. #YA-510-PH6-107

Submitted by:

Nevada Archaeological Survey,
Southern Division, UNLV
Richard H. Brooks, Daniel O.
Larson and Kathryne Olson,
Archaeology; Joseph King, Ethno-
Botany; Rovert Leavitt, Photography;
Kathryne Olson, Laboratory Analyst

Bureau of Land Management
September 22, 1976
Nevada Archaeological Survey,
Southern Division

ERRATA SHEET

Change the CRES S2 to CRES S3 on the following pages:

p. 27 (2)*
p. 29 (2)
p. 32 (2)
p. 34 (2)
p. 38 (2)
p. 40 (2)
p. 41 (2)
p. 44 (1)**
p. 47 (2)
p. 49 (2)
p. 51 (1)
p. 52 (1)
p. 54 (2)
p. 56 (2)
p. 61 (8)
p. 62 (8)
p. 63 (9)
p. 66 (2)
p. 67 (1)
p. 68 (1)
p. 70 (3)
p. 72 (1)
p. 76 (1)

* Number in parenthesis indicates number of changes on each page.

** 26CK1413 remains S2.

NEVADA ARCHAEOLOGICAL SURVEY,
SOUTHERN DIVISION

UNIVERSITY OF NEVADA, LAS VEGAS
4505 MARYLAND PARKWAY • LAS VEGAS, NEVADA 89154 • (702) 739-3382

CR Report: BLM 5-232(P)
ADDENDUM 1

-addresses historic site
significance & mitigati
-deletes p. 72.

November 23, 1976

State Director
Bureau of Land Management
Nevada State Office
Federal Building
300 Booth Street
Reno, Nevada 89502

Atten.: Robert York

Dear Sir:

In accordance with Purchase Order #YA-510-PH6-107 received from the Las Vegas District Office of the Bureau of Land Management, an archaeological surface survey was conducted by the Nevada Archaeological Survey (NAS), Southern Division in the Fort Mojave area. In the course of this investigation nine historic sites were recorded, of which eight were rated as "S3" values under the Nevada BLM's CRES guidelines and one site (CR NV-05-410) was rated as an "S2" property. The historic propertie merit concern, but none are of a quality to be listed in the National Register of Historic Places. Recommended mitigation measures, then, follow from these significance classifications:

1. Subject properties shall be considered for in situ preservation and if this should not be feasible:

2. Conservation of data shall be undertaken through appropriate techniques (photo records, mapping, excavation, etc.) decided upon in consultation with a historian and/or historic archaeologist prior to alteration of the property(s).

The above paragraph modifies and amends the recommendations given in the fourth paragraph, original page 75 of the Fort Mojave report and, is to

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be considered the final position of NAS in this matter.

The Nevada Archaeological Survey consulted with Dr. Ralph Roske, Professor, History Department, UNLV and John M. Townley, Director, Nevada Historic Society, in regards to the recorded historic sites.

In addition, page 72 of "The Fort Mojave Cultural Resource Inventory, An Archaeological/Historical Field Investigation in Southern Clark County, Nevada" is in error and should be deleted from the report.

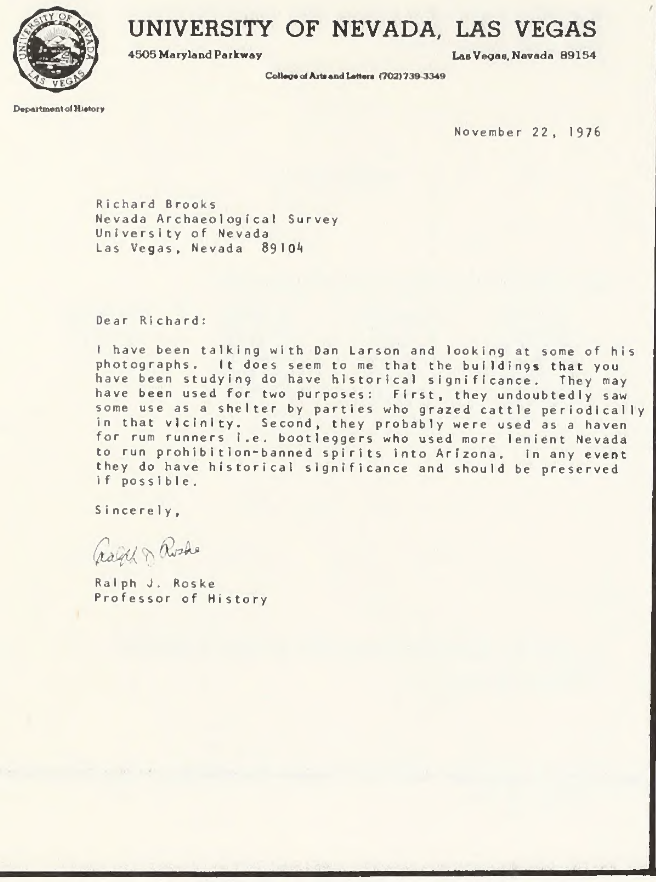
If I can be of any further assistance, please contact me at 739-3382.

Sincerely,

Daniel O. Larson

Daniel O. Larson
Senior Field Archaeologist

DOL:kv



UNIVERSITY OF NEVADA, LAS VEGAS
4505 Maryland Parkway Las Vegas, Nevada 89154
College of Arts and Letters (702) 739-3349
Department of History

November 22, 1976

Richard Brooks
Nevada Archaeological Survey
University of Nevada
Las Vegas, Nevada 89104

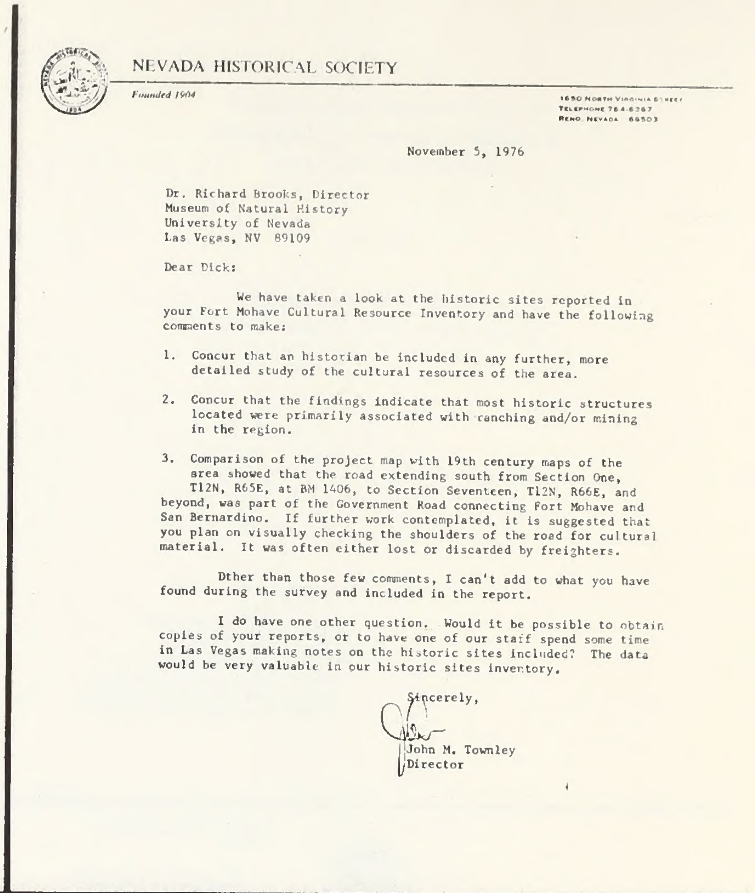
Dear Richard:

I have been talking with Dan Larson and looking at some of his photographs. It does seem to me that the buildings that you have been studying do have historical significance. They may have been used for two purposes: First, they undoubtedly saw some use as a shelter by parties who grazed cattle periodically in that vicinity. Second, they probably were used as a haven for rum runners i.e. bootleggers who used more lenient Nevada to run prohibition-banned spirits into Arizona. In any event they do have historical significance and should be preserved if possible.

Sincerely,

Ralph J. Roske

Ralph J. Roske
Professor of History



NEVADA HISTORICAL SOCIETY
Founded 1904
1650 North Virginia Street
Telephone 784-6387
Reno, Nevada 89503

November 5, 1976

Dr. Richard Brooks, Director
Museum of Natural History
University of Nevada
Las Vegas, NV 89109

Dear Dick:

We have taken a look at the historic sites reported in your Fort Mohave Cultural Resource Inventory and have the following comments to make:

1. Concur that an historian be included in any further, more detailed study of the cultural resources of the area.
2. Concur that the findings indicate that most historic structures located were primarily associated with ranching and/or mining in the region.
3. Comparison of the project map with 19th century maps of the area showed that the road extending south from Section One, T12N, R65E, at BM 1406, to Section Seventeen, T12N, R66E, and beyond, was part of the Government Road connecting Fort Mohave and San Bernardino. If further work contemplated, it is suggested that you plan on visually checking the shoulders of the road for cultural material. It was often either lost or discarded by freighters.

Other than those few comments, I can't add to what you have found during the survey and included in the report.

I do have one other question. Would it be possible to obtain copies of your reports, or to have one of our staff spend some time in Las Vegas making notes on the historic sites included? The data would be very valuable in our historic sites inventory.

Sincerely,

John M. Townley
Director

INTRODUCTION

On June 10, 1976, the Nevada Archaeological Survey (NAS), Southern Division, submitted a budget estimate in a bid for the Fort Mojave Cultural Resource Inventory project. Subsequently the bid proposal estimate of the NAS, Southern Division, was accepted by the Bureau of Land Management and a contract was established under Order Number YA-510-PH6-107. The project area to be surveyed was approximately seven square miles, consisting of about thirty quarter sections. This survey area is located in the most southeasterly portion of Clark County, Nevada, west of and in proximity to, the Colorado River.

The archaeological surface survey was conducted by staff members of the NAS, Southern Division, University of Nevada, Las Vegas (UNLV) working under the supervision of Dr. Richard H. Brooks, project director. The technical staff included Daniel O. Larson, field and technical supervisor, Joseph King, archaeologist/ethno-botanist, Kathryne Olson, laboratory analyst and field archaeologist and Robert Leavitt, archaeological photographer. The field archaeologists were Martin E. Bussard, Evan Crabtree, Robert Crabtree, Arnie Cunningham, and Dennis Jenkins.

Authority for archaeological survey in the State of Nevada has been granted to Dr. Richard H. Brooks through a Nevada State Antiquity Permit from the Nevada State Museum, and, through the Antiquities Act of 1906, by a Department of Interior Antiquity Permit, Number 76-NV-76, July 12, 1976, through July 11, 1976.

The cultural resource inventory of the Fort Mojave area was surveyed at BLM clearance level, Class 3, Intensive Inventory Survey in accordance with the Nevada BLM Information Memorandum No. NSD 76-59 (N-930.41), 4/29/76 and was completed over a six day field period which involved over sixty man days. Laboratory research, including lithic and ceramic analyses, as well as photographic development, required an additional eight man days; report preparation amounted to nine man days.*

The project inspector, Brian W. Hatoff, Archaeologist of the BLM Las Vegas District Office, maintained continual contact before and after the field work, and held several conferences with NAS staff to insure complete understanding of the stipulations of the contract. Through B. W. Hatoff, the BLM provided an excellent set of topographic maps with overlays to insure precision in the cultural resource inventory. Frank E. Bingham, Chief, Division of Resource Management for the Las Vegas District Office of the BLM facilitated the use of BLM data for environmental back-up materials necessary to the interpretation for the inventory of the project area.

This project is a cultural resource inventory and is not designed to include intensive historical, ethnological, climatic or comparative archaeological research. Previous archaeological surveys conducted by the NAS in this area are utilized to supplement the field observations of the geology, geography and biotic communities, in addition to providing other essential data with regard to the locations of potential site areas. The BLM final Environmental Statement (1975) for the project area has also assisted in the provision of background data and maps of the locale.

ARCHAEOLOGICAL SITE DATA REVIEW

There are no known recorded National Register archaeological sites within the area specifically designated by the BLM for the Fort Mojave area under consideration in this cultural resource inventory project. A. H. Schroeder conducted a survey for the National Park Service from Davis Dam to the International Border (1951) and C. Tuthill (1949) reported on an archaeological survey of the lower Davis Dam area for the National Park Service through the San Diego Museum of Man. Neither of these surveys recorded specific sites along the Colorado River in the Fort Mojave area.

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*This does not include the four man days spent preparing and typing BLM record forms.

Other archaeological research work in this lower Colorado River region has been done by the NAS, Southern Division, for a series of government contracts and one with a private firm with inventories of various types for such projects as transmission lines, pipe lines, proposed levee construction or other alterations. The first archaeological research by the NAS in this section of the Colorado River was conducted for the Bureau of Reclamation through the National Park Service, between 1968 and 1970, and involved a survey along both banks of the river from Davis Dam to the International Border. A side project of this major research, was a pipe line survey in 1970, where the line crossed the river north of Needles on the Fort Mojave Indian Reservation, the results of which were included in the overall project reports to the National Park Service. In 1973 a preliminary survey was undertaken for the Bureau of Reclamation through the National Park Service along a proposed transmission line on the east side of the Colorado River, which extended from Boulder City, to Davis Dam and Parker, Arizona. The archaeological investigation of sites reported in the preliminary survey was completed for the Bureau of Reclamation in 1975/76. In the process of a survey of proposed development areas in the Lake Mead National Recreation Area to determine their site potential for the National Park Service, archaeological inventory was conducted in areas just north of Davis Dam along the Colorado River at Catherine Landing and in the Christmas Tree Pass area of the Newberry Mountains, in 1974. Also in 1974 the NAS, Southern Division, reported on a preliminary survey of a proposed transmission line for the Southern California

Edison Company, which extended from the Nevada/Utah border through the Eldorado Valley to the Fort Mojave Power Plant and from there about one mile north of the northwestern boundary of the Fort Mojave survey area to the California border.

In the process of conducting these various surveys in the lower Colorado River region, the personnel of the NAS, Southern Division, acquired a background on the areas where archaeological site potential could be anticipated in the lower Colorado River region, either in the flood plains, along the river terraces or on the adjacent alluvial fans. In these previous surveys or inventories, no sites were encountered by NAS staff in the sections of the Fort Mojave project as delineated in this current proposal, since none of these surveys were conducted specifically within the boundaries of this project.

LOCATION OF THE ARCHAEOLOGICAL SURVEY

The archaeological survey was conducted in the Fort Mojave area, located in the southernmost tip of Clark County, Nevada, on the west side of the Colorado River (see Location Map). Bullhead City and Big Bend are situated on the east side of the Colorado River in Arizona, the latter city directly across from the project area. The Fort Mojave area is easily reached either from Las Vegas via U.S. Highway 95, turning east on the Davis Dam Road, Nevada State Highway 77, or from Needles via a new paved road on the west side of the Colorado River that now connects with Nevada Highway 77. This new road* from Needles to the Davis Dam Road, Highway 77, bisects the project area.

The legal description of the project area includes:

(1) All of sections 1, 12, and 13 and fractional sections 24 and 25, township 33 south, range 65 east.
(2) All of sections 6, 7, and 8, fractional sections 9, 10.

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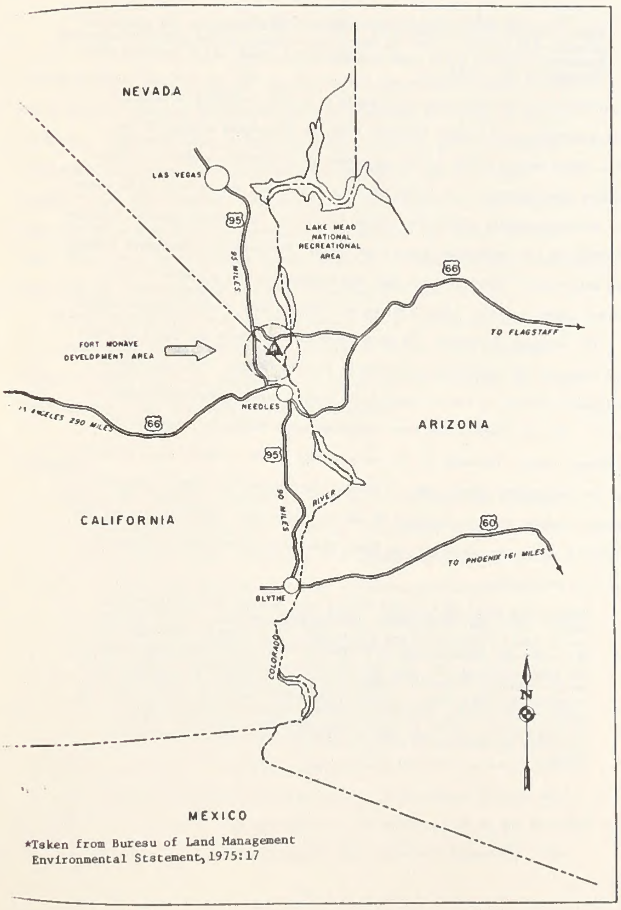
* Designated as the PEW road on the plastic overlays for the 7.5' series of topographic maps provided by the BLM.

LOCATION MAP*



*Taken from Bureau of Land Management Environmental Statement, 1975:17

and 15, east half, east half northwest quarter, and southwest quarter section 16, west half northeast quarter, west half, and southeast quarter fractional section 17, all of section 18, fractional sections 19, 20, 21 and 30, township 33 south, range 66 east (BLM Environmental Statement, 1975:1).

"Fractional" portions of a section mean that only a small piece of the section may not be included in the project area. These sections are located on U.S.G.S. topographic maps Mount Manchester, Nevada, California, and Arizona, 1970, 7.5 series, and Davis Dam Southeast, Arizona, Nevada, 1970, 7.5 series (see Location and Project Maps).

ENVIRONMENTAL BACKGROUND

Physical Factors. The lands under consideration in the Fort Mohave area are located in the Sonora Desert section of the Basin and Range physiographic province within the Colorado River Valley. This area is generally bounded on the north by the Newberry Mountains, on the west and southwest by the foothills of the Dead Mountains, on the south by the flood plain of the Fort Mohave Indian Reservation, and on the east by the channel of the Colorado River, which has been controlled and stabilized by the Bureau of Reclamation with a series of dikes and levees. The eastern third of the area is located on the remnant of the Colorado River flood plain that existed prior to the channelization of the river. This area is generally flat with sandy soils supporting dense, phreatophytic vegetation. West of the flood plain, the terrain rises on the alluvial fans of the Newberry and Dead Mountains. This alluvium supports a sparse, desert shrub vegetation (BLM Environmental Statement, 1975:23).

The climate of this project area is described as "typical" of the southern Great Basin arid environment. The four seasons are well defined. The summers are hot with daily temperatures commonly reaching above 100°F. The daily summer minimums, especially in the valleys range between the high 60's and low 70's. This nightly drop is created by cooler mountain air draining downward from the higher elevation, and active night radiation cooling. Winters are mild and short with average temperatures falling in the low 70's. Occasionally winter temperatures fall below freezing.

Summer precipitation generally occurs as a result of storm movement originating in the Gulf of California or the Gulf of Mexico. "The summer months bring violent thunder storms which form quickly and deliver their rain in sudden showers, causing occasional local floods and much erosion" (Longwell et al., 1965:58).

> Approximately 50 percent of the annual precipitation occurs during the winter months, December through February. During the five summer months, May through September, 25 percent of the annual precipitation is received. Most of this comes during July and August from a few short-duration, high intensity convective storms (BLM Environmental Statement, 1975:23).

During the time period of the archaeological survey it was noted that the air could be quite still in the project area with a high level of humidity created by convective storms in adjacent mountain regions. The nightly drop in temperature expectable in other parts of the southern Great Basin, did not occur in the arroyos or river flood plain area, although on the upper alluvial fan slopes there was a nightly cooling accompanied by slight breezes.

> The vegetation on the flood plain is typical of river bottom areas along many southwestern rivers and consists mainly of arrowweed, salt cedar, mesquite, willow, with occasional cottonwood, smoke tree, cattail, saltbush, acacia and pigmy cedar. A few annual grasses grow in the area;these are usually found where the overstory has been burned or where the water table is near the surface (BLM Environmental Statement, 1975:24).

The vegetation of the study area is a floristic blend of both the Mojave and Sonoran desert plants. Many of the flora encountered are found commonly in both regions, but occasional Sonoran plants have crossed the Colorado River and established viable populations. Of especial interest are the ocotillo (Fouquieria splendens) and the smoke tree (Dalea spinosa) that were observed to occur within the boundaries of the study area. This region is the only locale where the smoke tree occurs in the State of Nevada (Bradley, 1966). The most common specimens observed in the riverine environment and the flood plain were arrowweed (Pluchea sericea) and the introduced salt-cedar or tamarisk (Tamarix pentandra). The edible mesquites, honey bean (Prosopis juliflora) and screw bean (Prosopis pubescens) were noted growing in thick stands in some of the survey areas in the flood plain (Plate 1). The introduced tamarisk has already invaded the mesquite forest and is crowding these native plants (Plate 2).

"The alluvium supports a desert shrub vegetation, typical of alluvial fans in the Mohave Desert....Annual grasses and weeds appear when precipitation occurs and conditions are ideal" (BLM Environmental Statement, 1975:24) (Plate 4). The plant types common to the alluvial fans include creosote (Larrea divaricata), salt brush (Atroplex sps.) (Plate 3), burro bush (Franseria dumosa), cat's claw (Acacia greggii), Jimson weed (Datura meteloides), desert spiny herb (Oxytheca sps.) and snakeweed (Gutierrezia sarothae). Other plants that were observed are the ground cherry (Physalis crassifolia), coyote melon (Cucurbita foesitissima), Mojave yucca (Yucca schidigera), and milkweed (Ascelpias subulata). Various cacti located within the area include barrel cactus (Echinocereus engelmanni), buckthorn cholla (Opuntia acanthocarpa), jumping cholla (O. bigelovii) and beaver tail (O. basilaris). Many hardy specimens of pencil cactus (Opuntia ramosissima) appear to have reached an optimal height of 15 cm.

The fauna that inhabit this project area include fish, amphibians, reptiles, mammals and birds. The amphibians and reptiles consist of numerous lizards and snakes and other poikilotherms. The bird species found inhabit the area on both a year round and seasonal basis and it is a major migration stop for numerous species.

> Birds and waterfowl may be found primarily in the phreatophytic vegetation of the flood plain. Quail, hawks, vultures, mourning dove, owls, and numerous water birds and shore birds utilize the dense vegetation along the river. The sloughs and back water area inside the river levee system provides limited habitat for ducks, waterfowl and shore birds. Several species of snakes, lizards, frogs, toads and even turtles inhabit the subject area (BLM Environmental Statement, 1975:49).

PAGES 9 & 10 NOT INCLUDED

Mammals that frequent the area include shrews (family Soricidae), jackrabbit (Lepus californicus), desert cottontail (Sylvilagus auduboni), Yuma antelope squirrel (Ammospermophilus harrisi), valley pocket gopher (Thomomys bottae), pack rat (Neotoma lepida), many species of mice (families Heteromyidae and Cricetidae), coyote (Canis latrans), desert kit fox (Vulpes macrotis), gray fox (Urocyon cinereoargenteus), badger (Taxidea taxus), bobcat (Lynx rufus), and bighorn sheep (Ovis canadensis) (Blair, et al., 1968).

Population size of the various faunal types is related to the environmental factors. In this area faunal population sizes are greater along the Colorado River in the flood plain and in the mountains rather than on the alluvial fan slopes. It should be noted that migration is probable between both environments by several species throughout the year.

> In general, the alluvial fan area with the desert shrub vegetation, provides habitat primarily for a small population of nocturnal desert wildlife, which would include small rodents, lizards, and insects. Because of the arid nature of the area, little wildlife is seen in daylight hours, with the exception of perhaps lizards. The flood plain provides more food, cover and water for wildlife habitat, thus producing a more varied population (BLM Environmental Statement, 1975:49).
>
> Geology - The primary geological features of the area can be divided into two parts: (1) consolidated rocks; and (2) alluvium. The consolidated rocks are a complex of Precambrian igneous and metamorphic rocks consisting of gneiss, schist and granite, which form the Newberry and Dead Mountains to the north and southwest of the Fort Mohave area. Some tertiary sedimentary rocks consisting of non-marine clastics in some places interbedded with flow and pyroclastic rocks, and fresh water limestone are also formed....All unconsolidated to semiconsolidated alluvial deposits cover most of the area, including the flood plain. This alluvium probably ranges in age from Pliocene to Recent, with most of the exposed material to be of Quaternary age. The alluvial aprons of the Colorado River Valley are underlain by lenticular beds of gravel, sand, silt, clay eroded from adjacent mountains. Coarse alluvial materials are contained in numerous washes cutting the alluvial aprons. Older alluvial terrace deposits, scattered lake deposits, and dissected alluvial fan deposits occur in the Colorado River Valley (BLM Environmental Statement, 1975:29 taken from Rush and Huxel, 1966, which conforms with Longwell et al., 1965).

It was noted during the survey that there is a high incidence of granitic float materials in the upper alluvial fans; in the higher section of the apron, there were a number of low outcroppings of granite boulders. These boulders were thought to be potential site areas, but they proved to be negative archaeologically within the survey sections. The coarse alluvial gravels mentioned in the geological quote from the BLM Environmental Statement include also well-rounded river cobbles that are incorporated in a number of the ancient river terraces identified on the western side of the Colorado River.

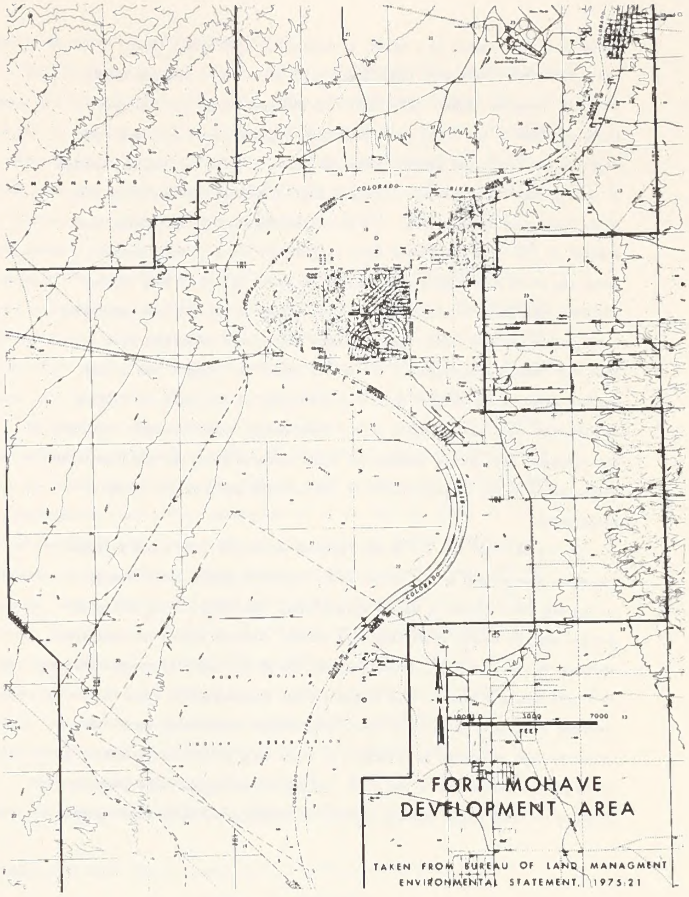
The Newberry Mountains, the Dead Mountains and their extensive alluvial fans dominate the landscape geologically in this region. The other major geological feature is the Colorado River basin, itself (Overview Plates 3 and 4). In the alluvial fan area sheetwash seems to be the predominant erosional factor, although on the western edge of the project area, close to the San Bernardino County line, California-Nevada border, there is a well-developed major wash in Sections 19 and 24 (Plate 23). Intensive survey was conducted along the edges and the banks above this major arroyo because of its site potential.

> Soils - The soils of the Fort Mohave area occupy two principal land forms: (1) river flood plain; and (2) alluvial fans. Soils on the nearly level flood plain are stratified, fine loamy sediments, for the most part superimposed in a few places by sand dunes....Joining the flood plain to the west are strongly sloping alluvial fans. The modern drainage system is deeply entrenched in these fans and tends to widen and form deltaic depositional areas where they join the flood plain....In general, the soils are coarse grained, derived mostly from granitic rocks. Depth to restrictive material and slope varies according to position on the fan (BLM Environmental Statement, 1975: 24-25).

It was observed during the current survey project that the sand dunes are more extensive than stated in the BLM report, quoted above, particularly in the northern section of the flood plain where it abuts against the second river terrace.

> Topography - Topography can best be described as two major features: (1) the flood plain below the 510' contour line; and (2) the alluvial fan above 510' elevation....The alluvial fan starts at the 510' elevation at the west edge of the flood plain and rises in elevation westward up to the lower alluvial slopes of the Newberry and Dead Mountains, to a maximum height of 1,560' in the extreme northwest corner....Numerous dry washes and channels dissect the alluvial materials on their way eastward to the Colorado River (BLM Environmental Statement, 1975:29) (See Topographic Map).

River terraces are another topographic aspect of the Port Mojave terrain which relate closely to the archaeological survey. The lowest terrace lies between the 490' and the 510' elevation and is in close proximity to the Colorado River (Overview Plate 1). This terrace marks the beginning of the flood plain where it extends from the lowest river terrace to the 510' contour line where the second river terrace is located. The second river terrace continues to the 600' contour. The terrain between the lowest and the second river terrace consists of fine alluvial sands and loamy silts and is a relatively recent soil deposit (Plates 1 through 4). The second terrace is formed of cemented river gravels with surface substrates comprising a desert pavement (Plates 5, 6 and Overview Plate 1). This terrace is being rapidly covered by alluvial wash from the higher fans and is heavily dissected along its eastern edge bordering the flood plain. Above the second terrace there are two ill-defined and one prominent ancient terrace formations which are remnants, partially buried in the alluvial fan overburden. The highest of these upper ancient terrace remnants appears as a distinctive landmark in Overview Plate 2 and all of these terrace remnants are readily identified in the topographic and the project maps. Approximate elevations for these ancient terraces are 540' to 580' for the lowest, the middle terrace remnants are at 600' to 680' and the highest and most prominent is at 800' to 880' elevation. The substrates on these terraces consist of gravel to cobble-sized materials composed mainly of crypto-crystallines and quartzites, heavily rolled and patinated. The surface is covered with the same types of materials which were utilized aboriginally as quarries for lithic workshop areas (Plate 30). These ancient terrace remnants represent the most important potential for archaeological site locales within this project area.



FORT MOHAVE DEVELOPMENT AREA

TAKEN FROM BUREAU OF LAND MANAGMENT ENVIRONMENTAL STATEMENT, 1975:21

PAGES 14 THROUGH 19 NOT INCLUDED

Above these ancient terraces the alluvial fan is heavily dissected by sheet erosion and contains no further evidence of exposed river terraces (Overview Plates 3 and 4). There were no cobble substrates on the fan, where the major components consisted of granitic gravels.

METHODOLOGY

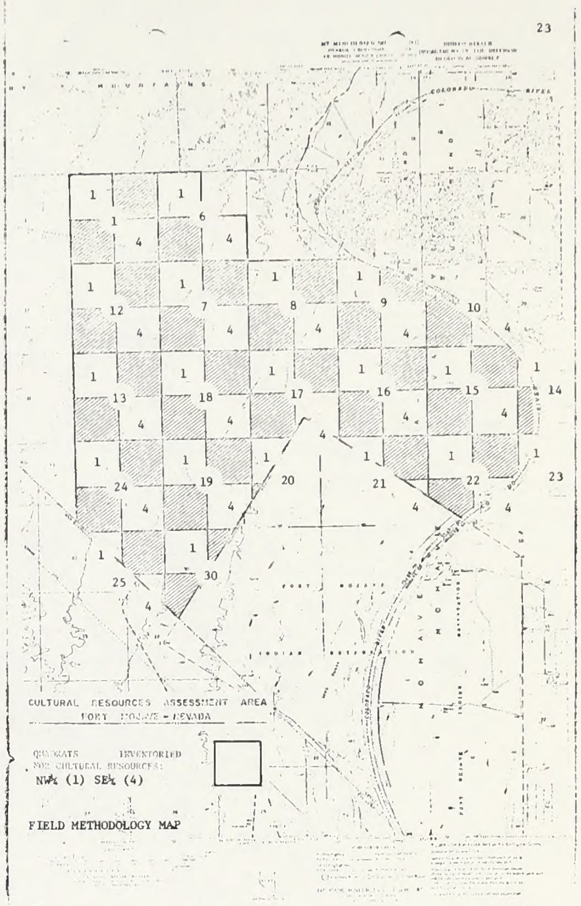
Prior to the intensive inventory survey of the project area, a preliminary reconnaissance was conducted, utilizing the previous knowledge of the area in combination with the new U.S.G.S. 7.5' advance sheets, provided by the BLM. In this reconnaissance all roads, including transmission line roads, gas line roads, paved roads, levee roads, mining roads and jeep trails were investigated to determine ease of access and survey control for the project. These roads were found to border section lines, transect section corners or midlines and many of them had direct access to the new paved road from Needles to Highway 77, which bisects the project area. In particular it was determined in this preliminary investigation that the test-pit mining roads frequently were situated on section lines. Some section markers also were located at this time. The perimeters of the private land in the NW corner of Section 16 and the NE corner of Section 17 were identified (Plate 20). The

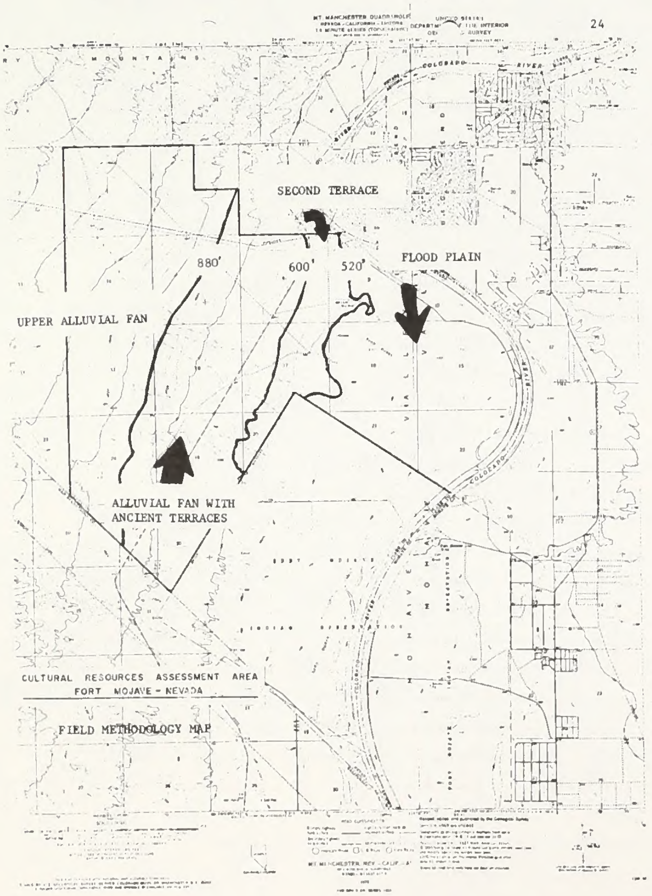
cemetery within this private land was visited (Plate 19) to determine its exact location, and later during the survey proper the cemetery was officially recorded as a historic site and is included with the site descriptions. This private land, where it had been cleared recently for a proposed trailer park, was an outstanding landscape feature and was utilized during the survey as a check point. The gas pipe line road, crossing the flood plain, also served as a distinctive marker to delineate the border between the BLM Lands and the Port Mojave Indian Reservation Lands. One factor aiding the location of section or quarter-section corners already mentioned were the several mineral exploratory roads in the alluvial fan area, which extended to the edge of the second river terrace. By following these exploratory roads access was available to most of the quarter sections to be surveyed.

During the actual survey a Brunton compass could be utilized to determine east-west and north-south orientation between known quarter-sections as the alluvial plain is a wide and relatively open landscape. Mileage checks were used throughout the survey project in combination with the Brunton compass sitings to determine quarter section distances and to assure accuracy.

In the contract between the BLM and the NAS, Southern Division, under Special Conditions, #2, the project area was to be investigated "at the Nevada BLM's clearance level #2 (Reconnaissance Survey)", in that only two quarter sections, the northwest and southeast one-quarters, were to be surveyed in each section within the Port Mojave project area. Within each selected quarter section the survey was to be conducted (see item #14 in the BLM contract with the NAS, Southern Division) at the Nevada BLM's clearance level, Class #3, Intensive Inventory Survey. This requires that the survey crew walk parallel transects close to 10 meters apart, where possible. Specifically item #14 of the BLM contract stated "if an area cannot be surveyed in this manner as a result of logistical limitations (e.g. excessively steep terrain), those areas shall be so noted on a map in the cultural resources report" (1976:#14). In the preliminary reconnaissance those portions of the flood plain with dense vegetation, as the tamarisk, mesquite and salt brush growths (Overview Plates 1 and 2 and Plates 1 through 4) were identified as having logistical limitations, so that survey methodology would have to be altered. In those quadrants (field methodology map) located in the flood plain with dense vegetation, the areas were walked where the dense growth permitted passage, or where animal or jeep trails provided visibility of the ground surface. Close observation was maintained along washes, around animal burrows (where evidence of subsurface site materials could be encountered) and in the eroded sand dunes. The ground surface is currently covered with wind-blown sand in the dunes, or fluvial and alluvial deposits elsewhere in the flood plain. These recently deposited materials may have buried prehistoric sites situated along the previous river banks, prior to the channelization of the Colorado River by the Bureau of Reclamation.

On the alluvial fan and on the terraces above the flood plain parallel transects were walked by the survey crew, spaced 10 meters apart, except in the few sheet washes or deeper arroyo cuts. The banks of the washes or arroyos and the ridges above them were closely examined during the survey, although in the wash beds, themselves, the survey was expanded to approximately 30 meters distance between crew members. When archaeological sites or isolated finds were encountered concentric circles around each locale were walked between transects to determine if there were additional materials, and to locate the perimeters of the site. In the few instances where granitic boulders or small hills occurred within the survey area, these were checked for shelter sites and/or rock art manifestations.





Survey sample unit designations were determined prior to the field work in a consultation between B. W. Hatoff, BLM, and D. O. Larson, NAS. Section numbers were utilized as sample unit numbers and these were broken down into their four quarters or quadrants; the northwest quadrant being 1, the northeast quadrant, 2, the southwest quadrant, 3, and the southeast quadrant, 4. For each section in the project area, following the BLM contract requirements, two quadrants were surveyed, the northwest (1) and the southeast (4). On the field methodology map these are indicated as "12-1", "12-4", etc. The site discussions, descriptions, results and recommendations begin with survey sample unit 10-4 in the northeast corner of the project area, proceeding south to the project area's southern boundary. Then the next series of sections is considered from the northern border to the southern boundary and this procedure is followed moving through to the west side of the project area boundary where the survey terminated.

All sites were evaluated by the BLM Cultural Resource Evaluation System (CRES) in the field to determine their cultural significance. Surface collecting of sites followed the method delineated in items #9 and #10 of the BLM contract with the NAS. No test-pitting was deemed necessary and collecting on sites of surface materials was only conducted on those sites that were designated as "small" sites or where isolated finds were encountered.

ARCHAEOLOGICAL SITE DESCRIPTION

In order to quantify the site data generated by this project, the following format has been organized for the purpose of archaeological site discussion; this material is presented for easy retrieval also in Table 1:

1. Permanent BLM Site Number (CR-NV-05-389)
2. Permanent NSM Site Number (26CK1407)

3. Nevada BLM "Cultural Resource Evaluation System" (S1)
4. Survey Unit Number (75-16)
5. Elevation from mean sea level
6. Location: township, range, section, quarters of quarter sections
7. Site Type, including any of the following or combinations:
   - A. Lithic - Any site containing lithic artifactual materials, including lithic concentrations as well as large to small scatter areas.
   - B. Lithic Quarry Workshops - Sites where rock cobbles and/or crypto-crystalline materials were quarried and prepared in the process of artifact manufacture.
   - C. Ceramic - A site at which one or more pottery sherds were found.
   - D. Historic - Any site at which historic debris such as tin cans, crockery and house foundations are found.
   - E. Isolate - Usually a single artifact or small concentration with no association to a site area.
8. Area of Occupation: extent of surface coverage.
9. Map Number: project map.
10. Plates: plate number in regard to photographs utilized in the report.
11. Situation: includes geographic situation and site location.
12. Description: includes metric measurements and direction orientation.
13. Deposition: includes an estimation or speculation of possible subsurface materials.
14. Artifacts: includes any cultural materials that were recorded in association with the site.
15. Remarks: includes present physical situation of the site.

RESULTS OF SURVEY AND SITE RECOMMENDATIONS

The Fort Mojave project terrain was basically divided into two physiographic areas, the Colorado River flood plain, which contained dense growths of vegetation, and the alluvial fan sloping from the Newberry and Dead Mountains towards the Colorado River valley, with a sparse vegetation cover. In the flood plain area, which composed approximately one-third of the survey area, no archaeological sites or isolated finds were located. These negative data probably relate to the heavy brush and tree cover and the depositional overburden characteristic of the sections adjacent to the Colorado River. Even in the dune areas within the flood plain, which generally are considered potential archaeological site locales, there was a complete absence of archaeological materials. Survey units included in the flood plain are 16-1, 16-4, parts of 21-1 and 21-4, 22-1 22-4 and part of 9-4 (Topographic map).*

On the second river terrace above the flood plain a number of historic and prehistoric sites were recorded. It is probable that the historic sites are the results of the BLM leasing land to small ranchers for cattle-grazing in the adjacent flood plain. During the survey in the flood plain, it was noted that there were a number of old fence lines, cut boards related to probable corrals, numerous cattle trails and other evidence of this type of useage. On the second terrace the historic sites consisted of an existing corral, possible corral remnants, square rock outlines that may relate to tent structures, with evidence of glass and nails in the vicinity, and historic dumps over the edge of the second terrace onto the flood plain below. In addition to the ranchers leasing land from the BLM, there may also have been squatters living on the terrace above the flood plain.

The majority of historic sites occurred in survey units 9-1 and 9-4. The historic sites, including the cemetery, found on the private land are

*These units were also included: 15-1,15-4,10-4,14-1 and 23-1.

located adjacent to survey unit 16-1, in the northwest quadrant of Section 16.

In survey unit 9-1 there were five historic sites and three prehistoric sites, all of which are rated by the Cultural Resource Evaluation System (CRES) as S-2. There were also three isolated finds of prehistoric material, both ceramic and lithic, which are rated as CRES, S-4. These sites from survey unit 9-1 are designated by BLM numbers 388 through 399 and are listed for easy data retrieval in Table 1.

For the historic sites the NAS recommends that either a historian or a historical archaeologist be consulted to determine the significance of these sites in the interpretation of the history of this southeastern portion of Clark County, Nevada. The prehistoric lithic workshop sites recorded in survey unit 9-1 will need to be photographed extensively, mapped and also need the implementation of a controlled method for sampling the frequency of occurrence of types of geological materials as well as the archaeological percussion techniques utilized. Site 26 CK 1405 contained rock outline features and it is recommended that it be mapped, photographed in detail and possibly have subsurface excavation. No recommendations are proposed for the three isolated prehistoric finds in these survey units.

In survey unit 9-4 there were two historic and four prehistoric sites which are rated CRES, S-2. The four isolated finds of lithic materials are rated CRES, S-4. These sites from survey unit 9-4 are designated by BLM numbers 400 through 409 and are listed in Table 1.

For the historic sites the NAS recommends that either a historian or a historical archaeologist be consulted to determine the significance of these sites and their relationship to the history of this portion of southern Nevada. The prehistoric lithic workshop sites recorded in survey unit 9-4 will need to be photographed extensively, mapped and have implemented a

comparable sampling method as that proposed in the recommendation for the survey unit 9-1 prehistoric sites. No recommendations are proposed for the four prehistoric isolated finds in these survey units.

In that portion of survey unit 16-1 located on the second river terrace there was one prehistoric site rated as CRES, S-2, and an isolated find of ceramic and lithic material rated as CRES, S-4. Adjacent to survey unit 16-1, on private land, is the historic cemetery, Site 26 CK 1413, which has been rated as CRES, S-2, and will need protection should this land be acquired or disturbed in the proposed development of the Fort Mojave area. These sites from survey unit 16-1 are designated by BLM numbers 410 through 412 and are listed in Table 1. Prehistoric site 26 CK 1412 contained rock outline features in association with lithic materials and it is recommended that it be mapped, photographed in detail and possible have subsurface excavation.

The small parts of survey units 21-1 and 21-4 situated on the second river terrace contained no historic or prehistoric materials.

Above the second river terrace is the wide sloping alluvial fan which includes the exposed ancient Colorado River terrace remnants. As described previously these exposed terrace remnants are covered with quartzite and other crypto-crystalline cobbles. No historic sites were encountered in this upper alluvial fan area. With the exception of the terrace remnants, where prehistoric sites were located, the bulk of the alluvial fan is covered by granitic debris distributed through sheet wash, consisting of fine sands and small granitic gravels.

The prehistoric sites found on the alluvial fan area were situated on the ancient river terrace remnants. These sites were recorded in survey units 8-1, two lithic quarry workshop areas with associated fragments of a ceramic olla (BLM numbers 413 and 414), survey unit 17-1, one lithic quarry workshop (BLM number 415), survey unit 17-4, one lithic quarry workshop (BLM number 416), survey unit 7-4, one lithic quarry workshop (BLM number 419), survey unit 18-1, one lithic quarry workshop (BLM number 420), survey unit 18-4, one lithic quarry workshop (BLM number 421), survey unit 19-4, one lithic quarry workshop (BLM number 422), and survey unit 30-1, one lithic quarry workshop (BLM number 423). All of these sites were rated S-2 by the CRES rating system.

Prehistoric isolated finds on the alluvial fan area were located in survey unit 6-1, an isolated ceramic (BLM number 417), survey unit 7-4, an isolated lithic (BLM number 418), survey unit 1-4 , an isolated ceramic (BLM number 425), survey unit 12-1, an isolated ceramic and lithic (BLM number 426), survey unit 12-4, an isolated ceramic and lithic (BLM number 427), survey unit 13-4, an isolated ceramic and lithic (BLM number 428) and survey unit 24-1, an isolated lithic (BLM number 429). One horseshoe was found in survey unit 1-1, an isolated historic find (BLM number 424). These sites are listed in Table 1.

It is recommended that the nine prehistoric lithic quarry workshops recorded in survey units 8-1, 17-1, 17-4, 7-4, 18-1, 18-4, 19-4 and 30-1 will need to be photographed extensively, mapped and have implemented a comparable sampling method as that proposed in the recommendation for the survey unit 9-1 prehistoric sites. No recommendations are proposed for the seven prehistoric and one historic isolated finds located in survey units 6-1, 7-4, 1-1, 1-4, 12-1, 12-4, 13-4 and 24-1. These sites recorded on the alluvial fan slopes are listed in Table 1.

No prehistoric or historic sites or isolated finds were encountered on the alluvial fan in survey units 8-4, 20-1, 6-4, 7-1, 19-1, 13-1, 24-4, 25-1 and 25-4.

SUMMARY AND CONCLUSIONS

This survey project has followed the two basic physiographic features of this region: 1) the flood plain of the Colorado River; and 2) the alluvial fan sloping westward towards the Newberry and Dead Mountains. In the flood plain no prehistoric material was encountered in the surveyed quadrants and historic material consisted of a few broken and cut boards and sections of abandoned fence lines. The flood plain contains dense growths of a variety of plant types and a heavy depositional overburden of riverine and some alluvial materials. One of the reasons for the dense growth in the flood plain is the introduction of salt cedar or tamarisk, which is crowding out the native vegetation. The construction of the dikes and levees along the river, created during the channelization of the Colorado River, would have contributed to the loss of any prehistoric sites which may have existed in the immediate vicinity of the river.

The second river terrace, which is the lowest extension of the alluvial fan just above the flood plain, contained all the historic sites located during the survey. These consisted of some historic material that appeared to be no older than 20 to 30 years, and other structures that could be earlier. The most important historic site is the cemetery, a site CRES rated as S-2 in this survey. It was included in the survey at the request of the BLM Las Vegas District Office that it be located and identified as to whether it was on private land or public domain. It was determined to be on private land.

The prehistoric sites on the second terrace consist of lithic quarry workshops, lithic scatters and concentrations and some rock outline features. There were isolated finds both of ceramics and lithics recorded in these survey quadrants. The isolated finds were collected and CRES rated as S-4.

The historic sites have tentatively been rated S-2 with the recommendation that a historical archaeologist examine them for final determination of their possible significance. The prehistoric sites have all been rated S-2 following Nevada BLM Instruction Memorandum No. NSO 76-120. These appear to be surface sites, based on the examination of arroyo cuts through the second terrace and their situation on desert pavement. Only a few features were recorded on each of these sites and they are not unique as this type of site has frequently been encountered in previous surveys conducted by the NAS in the lower Colorado River region.

On the upper alluvial fan no historic sites were found and only one historic isolate. Scattered evidences of recent cans, telephone wire, and cartridge cells were found over a widespread area and are related to army field maneuvers within the last 10 to 20 years. Prehistoric sites, for the most part, were confined to the ancient exposed Colorado River terrace remnants. The substrates of these terrace remnants were utilized as quarry workshop areas. Most of the artifact materials found in these workshops were made with minimal preparation, involving a type of percussion manufacture. No diagnostic artifacts were encountered among lithics of these quarry workshops. There is no indication that the quarry workshops have any great time depth or can be related to the creation of the river terraces from which these ancient remnants were derived. Ceramics were found at two of the workshop areas on the terrace remnants and other sherd ware was found as isolates in the upper alluvial fan area.

The prehistoric sites on the alluvial fan were rated S-2 following the Nevada BLM Instruction Memorandum No. NSO 76-120, on the same basis as those on the second terrace. All the isolated finds, including the single historic horseshoe, were collected and CRES rated as S-4.

The ceramic and lithic material collected during this survey has been catalogued and the catalogue sheets are appended to this report. In the process of cataloguing these materials they have been quantified, analyzed and summarized. Procedures utilized in this analysis are similar to those found in the BLM, Granite Reef Report (1976).

Fifty-nine sherds of pottery were recovered during this survey. Fifty-two of these sherds are of Lower Colorado Buffware. Eleven sherds exhibited a stucco finish, characteristic of this ware. Lower Colorado Buffware was made by Yuman groups along the Lower Colorado River and Schroeder (1951) dates it at pre-900 A.D. to post-1900 A.D. Seven of the sherds recovered are of Tizon Brown Ware. This ware is attributed to the Upland Arizona Yuman Indians by Dobyns and Euler (1958). They date Tizon Brown Ware at about 700 A.D. to 1890 A.D.

Lithic materials collected during the Fort Mojave survey are characteristic of a percussion flake and tool technology. Lithic material consists mainly of large percussion flakes recovered from cobbles, randomly flaked cobbles and cobbles exhibiting minimal unifacial and bifacial flaking along edges formed by percussion. Microscopic utilization evidence, when present, was of battering. Quarry material consists of several varieties of quartz including chert, chalcedony and quartzite. A few objects were made from porphoritic igneous material.

Only two quadrants out of each section in the project area were surveyed, following the contract specifications, but this has demonstrated the locales where site potential and concentrations occur. In the flood plain no observable sites were encountered during the survey, but there is the possibility of subsurface historic or prehistoric materials being found during bull-dozing or vegetation clearing in the developments proposed for this area in the BLM Environmental Statement, 1975. For those quadrants not surveyed during this project in the flood plain, it is recommended that archaeological clearance be given on the basis of the alternate quadrants that were surveyed where no material was encountered. For those quadrants in the flood plain that have been surveyed, it is recommended that archaeological clearance be given.

The survey on the second terrace, and on the ancient terrace remnants of the alluvial fan, has demonstrated a high potential for some type of archaeological materials in association with these geographical features. A survey at a clearance level of Class 3 (according to Nevada BLM Memo. #76-59) is recommended for those alternate quadrants, with a specific design included to locate other possible terrace remnants on the alluvial fan.

No controlled surface or extensive field examinations have been conducted by archaeologists working on the west side of the Colorado River from which relevant data can be ascertained. Consequently, it is difficult to assess the significance of the Fort Mojave archaeological sites based on the criteria set forth in 36CFR800.10.

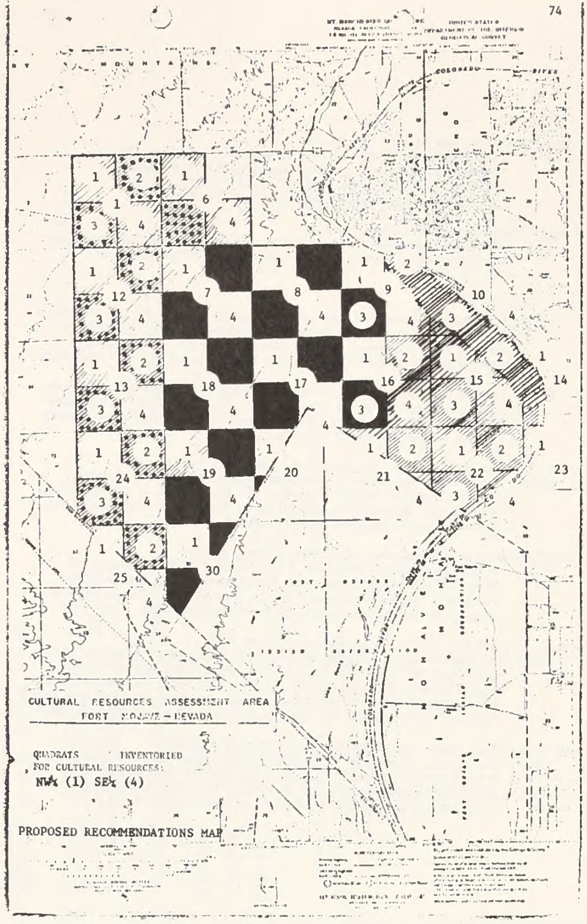
The following list represents a summation of the recommendations proposed by the Nevada Archaeological Survey for the Fort Mojave Project:

Archaeological clearance is recommended for the following surveyed units and the area coded ▨ on the Proposed Recommendations Map:

Flood Plain	10-4, 15-1 and 4, 16-4, 13-1 and 4, 24-1 and 4, 22-1 and 4 and part of 9-4.
Alluvial Fan	1-1 and 4, 12-1 and 4, 13-1 and 4, 24-1 and 4, 25-1 and 4, 6-1 and 4, 7-1 and 19-1.

Archaeological clearance is recommended for the following unsurveyed units which are coded ▨ on the Proposed Recommendations Map.

Flood Plain	9-2, 10-3, 15-2 and 3, 16-2, 21-2, 22-2 and 3.



MOUNTAINS
COLORADO RIVER
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CULTURAL RESOURCES ASSESSMENT AREA
FORT MOJAVE - NEVADA
QUADRATS INVENTORIED FOR CULTURAL RESOURCES:
NW¼ (1) SE¼ (4)
PROPOSED RECOMMENDATIONS MAP

To locate possible pictographs or petroglyphs and shelters adjacent to boulder outcrops, and other possible lithic quarry workshops situated on ancient river terraces, the Nevada Archaeological Survey recommends that a limited Class 2 Reconnaissance Inventory Survey (spot check) be conducted in the following unsurveyed units situated on the alluvial fan (coded ░ on the Proposed Recommendations Map):

1-2 and 3, 12-2 and 3, 13-2 and 3, 24-2 and 3, and 25-2.

To locate other possible prehistoric sites situated on the alluvial fan in the unsurveyed units adjacent to the recorded extensive lithic quarry workshop, the Nevada Archaeological Survey recommends a Level 3 (Intensive) Survey be conducted in the following units (coded ■ on Proposed Recommendations Map):

9-3, 16-3, 8-2 and 3, 17-2 and 3, 20-3, 7-2 and 3, 18-2 and 3, 19-2 and 3 and 30-2 and 3.

The Nevada Archaeological Survey recommends mitigation measures including mapping, extensive photography and the implementation of a controlled method for sampling for the prehistoric sites situated in the following survey units (coded □ on the Proposed Recommendations Map):

9-1, sites 388, 391 and 392; 9-4, sites 400, 402, 403 and 404; 16-1, site 411; 8-1, sites 413 and 414; 17-1, site 415; 17-4, 416; 7-4, site 419; 18-1, site 420; 18-4, site 421; 19-4, site 422; 30-1, site 423.

The Nevada Archaeological Survey recommends mitigation measures including consultation with a historian and/or historic archaeologist for historic sites situated in the following survey units (coded □ on Proposed Recommendations Map):

9-1, sites 389, 390, 393, 394 and 395; 9-4, sites 401, 405 and 410; 16-1, site 412.

Without the recommended mitigation for the sites already recorded and historic and prehistoric surveys of the adjacent northeast and southwest quadrants of the second terrace and alluvial fan, no recommendation for clearance can be made to allow for the developments proposed in this area in the BLM Environmental Statement, 1975. The recommended mitigation will involve mapping, photography, and the development of a sampling technique to determine the function of the sites and the artifact assemblages

recorded in the Fort Mojave survey area. No apparent National Register sites (CRES, S-1) were encountered during this survey meeting the criteria of 36CFR800.10. The sites rated as S-2 are considered to have a potential for contributing data to aid in the determination of possible prehistoric task-specific sites and habitation patterns in this southern Great Basin region of the Colorado River valley.

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Nevada Archaeological Survey
University of Nevada,Las Vegas
Laboratory Catalog - Isolated Finds

Project: BLM, Fort Mojave
Collector: NAS Field Crew
Date Collected: July 26, 27, 28, 1976
Type Collection: Survey

Cataloger: Olson
Date: 8/24/76
Page: 1

Site No.	Catalog No.	Quantity	Description - Material	Level	Remarks
FM-35	5-503-1	1	mule or donkey shoe	surface	
FM-1	5-504-1	2	sherds, plainware	"	
FM-2	5-505-1	1	sherd, plainware	"	
FM-32	5-506-1	4	waste flakes, quartzite & fossil	"	
	5-506-2	1	river cobble, flaked along one edge	"	
FM-15	5-507-1	3	waste flakes, chert & chalcedony	"	
FM-36	5-509-1	1	large waste flake-secondary. volcanic	"	
FM-31	5-510-1	10	waste flakes, quartzite, volcanic, and chert	"	
	5-510-2	1	river cobble, unifacially flaked along one edge, quartzite	" "	
	5-510-3	1	sherd, plainware	"	
	5-510-4	3	rimsherds, plainware	"	
FM-16	5-512-1	1	waste flake, quartzite	"	
	5-512-2	1	core, globular, quartzite	"	
	5-512-3	6	sherds, plainware	"	
FM-18	5-513-1	1	waste flake, chalcedony	"	
	5-513-2	1	waste flake, quartzite	"	

Nevada Archaeological Survey
University of Nevada,Las Vegas
Laboratory Catalog - Isolated Finds

Project: BLM - Fort Mojave
Collector: NAS Field Crew
Date Collected: July 26, 27, 28, 1976
Type Collection: Survey

Cataloger: Olson
Date: 8/24/76
Page: 2

Site No.	Catalog No.	Quantity	Description - Material	Level	Remarks
FM-37	5-514-1	2	river cobbles randomly flaked, quartzite	surface	
	5-514-2	1	large river cobble flake, bifacially flaked to form chopping edge, quartzite	"	
FM-20	5-515-1	1	large waste flake	"	
	5-515-2	1	flake scraper, unifacially worked, minimal utilization, chalcedony	"	
FM-17	5-516-1	1	river cobble, unifacially flake, battered along one edge, quartzite	"	
FM-3	5-517-1	1	possible core fragment, quartz	"	
	5-517-2	1	sherd, plainware	"	
FM-5	5-518-1	2	waste flakes, chert & volcanic	"	
	5-518-2	1	hammerstone fragment, battered along edge, some flakes removed. volcanic	"	
	5-518-3	2	sherds, plainware	"	
	5-518-4	11	sherds, stuccoware	"	
FM-38	5-519-1	1	primary flake, possible secondarily flaked no utilization. chert	"	

Nevada Archaeological Survey
University of Nevada,Las Vegas
Laboratory Catalog - Isolated Finds

Project: BLM - Fort Mohave
Collector: NAS Field Crew
Date Collected: July 26, 27, 28, 1976
Type Collection: Survey

Cataloger: Olson
Date: 8/24/76
Page: 3

Site No.	Catalog No.	Quantity	Description - Material	Level	Remarks
FM-38	5-519-2	1	cobble randomly flake, one edge formed, possibly battered along unworked edge	surface	
	5-519-3	1	sherd, historic ceramic, possibly worked along one edge	"	
FM-6	5-520-1	1	core on a river cobble, battered along one edge	"	
	5-520-2	1	sherd, plainware	"	
FM-23	5-522-1	1	waste flake - chalcedony	"	
	5-522-2	5	sherds, plainware	"	
FM-8	5-523-1	1	river cobble, possibly battered	"	

Nevada Archaeological Survey
University of Nevada, Las Vegas
Laboratory Catalog - Permanent Sites

Project: BLM - Fort Mojave
Collector: NAS Field Crew
Date Collected: July 26, 27, 28, 1976
Type Collection: Survey

Cataloger: Olson
Date: 8/24/76
Page: 2

Site No.	Catalog No.	Quantity	Description-Material	Level	Remarks
26 CK 1406	5-508-1	4	waste flakes, chert & quartzite	surface	
26 CK 1403	5-511-1	1	sherd, historic ceramic with trade mark	"	
26 CK 1412	5-521-1	2	waste flakes, quartzite & chalcedony	"	
	5-521-2	1	shell cartridge, W.R.A. Co., 44 W.S.F.	"	
26 CK 1417	5-524-1	27	sherds, plainware	"	

THE FORT MOJAVE CULTURAL RESOURCE INVENTORY,
AN ARCHAEOLOGICAL/HISTORICAL FIELD INVESTIGATION
IN SOUTHERN CLARK COUNTY, NEVADA

SECOND PHASE

October, 1977

Prepared for the Bureau of Land Management
Nevada State Office, Reno, Nevada

P.O. #NV950-PH7-2444

Submitted by:

Archaeological Research Center,
UNLV Museum of Natural History
Richard H. Brooks, Joseph King
Matt McMackin, David Ferraro,
and Kathryne Olson, Laboratory
Analyst

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INTRODUCTION

In August, 1976, the then Nevada Archaeological Survey, Southern Division (since July 1, 1977 the Archaeological Research Center of the UNLV Museum of Natural History), University of Nevada, Las Vegas (UNLV), submitted a report prepared for the Bureau of Land Management (BLM) on archaeological field investigations in the southernmost part of Clark County, Nevada. This work was done under BLM P.O. #YA-510-PH6-107 and the report is entitled "The Fort Mojave Cultural Resource Inventory, An Archaeological/Historical Field Investigation in Southern Clark County, Nevada". This project inventoried approximately seven square miles or about 30 quarter sections, which was about one-half of the total BLM land in the Fort Mojave resource area. The Fort Mojave area is located in the southeastern tip of Clark County, Nevada, and portions of the survey area abut against the western bank of the Colorado River. The locale is opposite the southern portion of Bullhead City, Arizona, in the section called "Big Bend".

In June, 1977, the Archaeological Research Center (ARC) received a request from Robert York, Archaeologist for the Division of Resources, Nevada State Office of the BLM, to complete a second phase of the inventory of the Fort Mojave area. This was to include the quarter sections unsurveyed during the first investigation of Fort Mojave, and amounted to approximately five and a half square miles. This second survey was to complete the archaeological inventory of the Fort Mojave area for the BLM. In the quarter sections adjacent to those where no

cultural resources were encountered during the first survey, a spot check type of investigation was to be conducted, and in those quarter sections adjacent to cultural resources recorded during the first survey, a more intensive investigation was to be done. The flood plain on the western banks of the Colorado River, which is heavily covered with vegetation, as described in the first report, was not to be included during this second survey to complete the Fort Mojave cultural resource inventory. In addition lands adjacent to the Fort Mojave survey area, where it was necessary to determine the boundaries of a site locale were to be included as needed.

A budget estimate was sent to the Nevada State Office of the BLM for the approximate cost of conducting this proposed second phase of the investigation. On July 27, 1977, P.O. #NV950-PH7-2444 was received with the BLM authorization to carry out this proposed project.

This cultural resource investigation was conducted by staff members of the ARC, working under the supervision of Dr. Richard H. Brooks, project director. The field staff consisted of Joseph King, David Ferraro, Matt McMackin, Sheilagh Brooks and R.H. Brooks. Cary Stevens is the ARC staff photographer and Kathryne Olson, the laboratory analyst. Twenty-five man days were spent in the field during this survey over a period of five days. Less field time was necessary for this second inventory as all the access roads were known, the section markers had already been located previously, access to the quarter sections to be surveyed was familiar and the flood plain quarter sections did not have to be

surveyed. These latter had involved time and effort during the first survey related to the heavy growth of vegetation, particularly mesquite and tamarisk. Fewer sites were encountered during this second survey, which reduced the field time necessary for recording the data, and has also reduced the amount of laboratory time as fewer artifacts were recovered. Laboratory and report time has amounted to approximately 10 man days.

Contact was maintained during this survey with R. York in Reno and Stanton D. Rolf, Archaeologist for the Las Vegas District Office of the BLM. Through the Las Vegas District Office maps and flagging for the site locales was provided during this inventory.

This project is a cultural resource inventory and is not designed to include intensive historical, ethnological, climatic or comparative archaeological research. Previous archaeological surveys conducted by the ARC staff are utilized to supplement the field observations of the geology, topography and biotic communities, in addition the first inventory in the Fort Mojave area provided essential data with regard to the locations of potential site areas. The BLM final Environmental Statement (1975) for the project area has also assisted in the provision of background data and maps of the locale.

Authority for archaeological survey in the State of Nevada has been granted to Dr. Richard H. Brooks through a Nevada State Antiquity Permit from the Nevada State Museum, and, through the Antiquities Act of 1906, by a Department of Interior Antiquity Permit, Number 77-NV-096, August 11, 1977, through August 10, 1980.

Since this second phase of the inventory project is constructed

as a separate investigation with an individual report on the Fort Mojave area, the background information regarding archaeological site data review has been expanded with a historical resume of archaeological research associated with the building of Davis Dam, and subsequent National Park Service or Bureua of Reclamation archaeological surveys. In addition an ethnological overview is included of the Mojave Indians by David Rupert, as well as recently obtained information on the history of the area, based on the research of Dennis Casebier, and of Phillip Earl.

ARCHAEOLOGICAL SITE DATA REVIEW

This section consists of an archaeological resume of research along the Colorado River south of Hoover Dam and north of Parker Dam*.

Based on Harringtion's 1936 report the first professional archaeological research in the new Lake Mohave region apparently began sometime in 1935. Willow Beach, or Pebble Beach as it was called originally, is located approximately nine miles downstream from the present site of Hoover Dam. The site is on the Arizona site of the Colorado River, about one-quarter of a mile upstream from the mouth of Jumbo Wash where the present marina and concessions are situated. Harrington reported this site as being on a narrow terrace about 30 feet above the water level of the Colorado River as it was prior to the construction of Davis Dam. "Here Indian pottery and stone implements have been washed out by spring floods for some years, and here, in the face of the cut bank, beds of ashes and charcoal could be scattered from the surface to a depth of about nine feet with layers of sand and silt between. It was evidently a camp-site occupied at frequent intervals for many centuries" (Harrington, 1936:5). The excavation of the site at Willow Beach was supported by the Works Progress Administration (WPA) and through this agency CCC enrollees were provided. The work at the site was under the direction of Harrington's junior foreman, Willis Evans. The excavation was conducted sporadically over a two month period, with a crew of 18 to 20 men.

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*This resume section is taken from a manuscript prepared by Brooks et al (1977) for the National Park Service, as part of a Lake Mead National Recreation Area overview, and is on file at the Western Regional Office of NPS, Tucson, Arizona.

An area within the site 40' long, 38' wide, with a maximum depth of 9'6" was dug with trowels and shovels. The use of trowels was considered necessary in certain areas "as specimens are likely to appear anywhere in the whole nine feet of depth except for one barren stratum of varying thickness just below the middle of the deposit" (Harrington, 1936:5). The excavation produced numerous artifacts and:

> "the very surface yields arrowpoints and other articles of comparatively recent Paiute Indian make; directly below these are found Early Pueblo arrowpoints and pottery fragments down to a depth of about four feet. Beneath this Pueblo level comes the barren stratum above mentioned...and beneath this again a succession of ash layers which yield numerous worked flints and the split bones of food animals, but no pottery at all. Some very fine spear heads and dart points were found here, resembling in a general way the forms identified with the old Basketmaker II period; there are also some snub-nosed scrapers, which in Nevada seem to be associated only with the older peoples. Among the animal bones found in these deposits are bones of the elk which could not live in the Boulder Dam district at present on account of the arid climate conditions; consequently these older terrace deposits must have been laid down when the climate of southern Nevada was considerably moister than at present.
>
> Three human burials have been found thus far at the Pebble Beach site, all, apparently belonging to the Early Pueblo period. One was covered with large shell beads and was accompanied by Pueblo pottery and arrowpoints. There was also one dog burial found here" (Harrington, 1936:5-6).

Harrington estimated at the time he was there that about one-third or one-fourth of the total deposit of the Willow Beach site had been excavated and recommended additional research of this site, which he considered to be extremely important.

No further published archaeological research was conducted in the area between Hoover Dam and the site of the proposed Davis Dam until the early 1940's. Davis Dam construction began in 1942, was interrupted by

World War II, continued again in 1946 and was completed in 1953. In 1943 Gordon C. Baldwin, assistant archaeologist for the Boulder Dam National Recreational Area, began a survey of the areas to be covered by the lake formed through the construction of the Davis Dam on the Colorado River. "This survey was carried out to see what, if any, archaeological sites would be flooded and destroyed by the construction of Davis Dam and the consequent flooding of the area. All prehistoric and historic Indian sites were to be investigated in order to determine their archaeological importance to ascertain whether any of these sites were of sufficient scientific importance to justify their excavation before the construction of Davis Dam. The area included in the proposed Davis Dam Reservoir ares lies along the Colorado River in the states of Arizona and Nevada, extending about 67 miles below Boulder Dam" (Baldwin, 1943:1).

> "For purposes of numbering and partially locating archaeological sites the following system has been utilized. A state is divided by each degree of latitude and longitude into rectangles; beginning in the upper lefthand corner of the state these rectangles are numbered A, B, C, D, etc. Each of these rectangles is then divided into 16 equal smaller rectangles, being numbered from 1 to 16, starting in the upper lefthand corner again. Sites are then numbered consecutively as they are found in each of these sub-rectangles, Arizona F:2:7 meaning the 7th site in sub-rectangle No. 2 of the 6th rectangle No. F, in Arizona. As state boundaries do not always follow degree lines, a rectangle is given the state designation of the state having the larger portion of a given rectangle. Thus, in this particular area, the entire region is in the large rectangle Arizona F, even though a portion of it lies in the state of Nevada. By means of the sub-rectangles the area covered by this survey cao be divided into three subareas, Arizona F:2 down to the mouth of lower Black Canyon, Arizona F:6 south to and including Round Island, and Arizona F:10 through Cottonwood Valley" (Gordon, 1943:11).

The survey was started on March 17, 1943 and was finished by May 7, 1943, with a total of 25 days spent in the field. An outboard boat was utilized for a period of 8 days for a survey of the banks on both sides of the river. The remainder of the survey was conducted on foot, utilizing a

car for access.

> "The area covered by this archaeological survey included both sides of the river from Willow Beach down to and including most of Cottonwood Valley. The area between Willow Beach and Boulder Dam was not covered inasmuch as the use of a boat would have been necessary. In addition, there are very few flats in this section and, since this marks the upper limit of the lake, with but little rise in water level, there would be very few sites covered. The area between Cottonwood Valley and the Davis Dam site lies almost entirely outside the boundaries of the Boulder Dam National Recreational Area. As these flats have been frequently flooded, there are probably few sites that can be definitely located. However, this area would have been covered also if a boat could have been secured for a few additional days. One hundred and fifty-five archaeological sites were located in the area covered by the survey... many of these sites are quite small temporary campsites and would not warrant further investigation. About 15 of these sites are of sufficient size and importance to be tested and at least partially excavated..." (Baldwin, 1943:8-9).

Between Willow Beach and the Cottonwood Island (which from Baldwin's information was the southern edge of the Boulder Dam National Recreational Areas at that time):

> "sites are located mainly on the small benches or flats bordering the river. While there are a few situated on the tops of the low gravel ridges just above these benches, fully 97% of the sites are to be found along the lower sand and gravel flats...These archaeological sites are usually located on or near sand dunes, generally being on the south or southeast edge of the dune. However, a number of the larger, more permanent villages were situated at or near the center of a large, relatively flat sandy area. Most of these sites are small temporary campsites, probably being utilized on seed-gathering or hunting trips. This is especially true of most of the small rock-shelters located in the side of the rocky ledges in back of these sandy benches...
>
> This preliminary survey indicates that the following groups occupied this area at certain periods: Pueblo and Patayan cultures in prehistoric times, and the Paiute, Mohave and Walapai groups in the historic period. During the earlier era the Patayan culture was dominant, Pueblo elements appearing only as secondary influences wherever they occur. The Walapai and Mohave occupied much of the area during more recent times, artifacts of the Paiute culture appearing only sporadically along the upper canyon the the vicinity of Willow Beach" (Baldwin, 1943:10-11).

In 1947 Baldwin returned to resume his work in the Davis Dam reservoir area as a NPS Park Naturalist in the Lake Mead Recreational Ares. This

research was a continuation of the work he had started in 1943 on archaeological sites he had located in his original survey and had recommended for further work. In 1947 the NPS funded Baldwin "to wash, label, and box all of the material recovered from the 1943 surface survey, to commence preliminary testing at five selected sites, to resurvey eight sites, and to survey five additional sites" (Baldwin, 1943:3). Late that same year additional funds were provided by NPA "permitting us to place a small excavation party in the field for about eleven weeks. During this period four sites were partially excavated, two others were thoroughly tested, and considerable minor testing and surveying was done at ten other sites" (Baldwin, 1948:3-4). During the time that the 1943 and 1947 recovered material was being cleaned and catalogued, material from six of the small cave sites excavated in 1936 by the CCC were also catalogued.

Of the 15 sites that Baldwin had considered important seven were resurveyed and tested with varying thoroughness and eight were resurveyed and test trenched where necessary. Ten additional sites from the 1943 research were resurveyed, one other was resurveyed and tested and five new sites were encountered and recorded in 1947. Baldwin did not work south of Cottonwood Valley, although he recommended in both his 1943 and 1948 reports that this area needed to be surveyed archaeologically prior to the completion of Davis Dam and the impounding of the lake waters.

The major sites that Baldwin excavated or tested are briefly reviewed in the following paragraphs. Arizona F:6:14 is located about seven miles south of Eldorado Canyon on a sandy bench within a wash area. Potsherds, flakes and fragments of a metate were on the surface of the site. "A series of five trenches were laid out equally spaced about the south and west sides of the bench...each about four feet in width and were extended down to undisturbed river gravel, a depth varying from one to two feet at the edge of the bench to a maximum of three and a half feet nearer the center" (Baldwin, 1948:12). One cross trench was dug and six small test pits. There were no apparent stratigraphic sequences, no evidence of house structures or of storage pits. There was one possible exception, a hard packed area. Numerous potsherda were encountered in the excavation, but few artifacts other that stone tools, including manos, metates, projectile points, knife blades, scrapers and some ornaments. A few gypsum pendants were found, worked and unworked animal bone and only two shell fragments. Two thousand four hundred and thirty-five sherds were collected, only 40 were decorated while the remainder consisted of plain ware. Most of the plain ware was divided into three types, Topoc Buff, Topoc Stucco and Pyramid Gray. In addition there were two new types, which Baldwin named, after consultation with Colton, Eldorado Gray and Searchlight Brown. The decorated ware types included Needles Red-on-Buff, Topoc Red-on-Buff, Cerbat Red-on-Brown, and Aquarius Black-on-Orange.

Arizona F:6:22 was a large site about one and a half miles south of the previous site. The site was approximatley 250 feet by 300 feet in size and was composed of low sand dunes with intervening eroded area. It was in the latter areas that the majority of the archaeological material was encountered. Over seven, non-consecutive, days the site was surface collected, three trenches and six test pits were dug. The site was shallow, with the major portion of the material being found in the upper three to four inches of midden. There were no indications of houses, but several fire hearths were encountered. Stone objects recovered included hammerstones, manos, metates, pestles, mortars and smoothing stones. The 74 flaked stone artifacts included projectile points, knife blades, scrapers, and drills. A total of 1,237 sherds were collected, of which 1,194 were plain ware, including Topoc Buff, Topoc Stucco, Pyramid Gray, Eldorado Gray, Searchlight Brown, Sacramento Brown and Aquarius Brown. The few decorated sherds were of the Topoc Red-on-Buff, Needles Red-on-Buff, Aquarius Black-on-Gray and the Tusayan Black-on-Red types. Six sherds were considered intrusive types: Sosi Black-on-White, a probable Black Mesa Black-on-White and Boulder Black-on-Gray.

Arizona F:6:75 was located on the Nevada side of the river, a half mile south of Aztec Wash. Three parallel trenches were excavated across the upper part of the site and several small test pits, all containing only a few fragments of cultural material. Four trenches were excavated on the lower portion of the site which were more productive of artifacts. No house remains were encountered, lithic material was abundant including projectile points, knife blades, scrapers, choppers, metates, manos, mortars, pestles and a fragment of a maul or hammer with a shallow groove. Eight hundred and thirty-five potsherds were recovered of which only one was decorated, a fragment of a Topoc Red-on-Buff jar. The plain ware types included Pyramid Gray, Eldorado Gray, Topoc Buff, Topoc Stucco, Searchlight Brown and Sacramento Brown. Pyramid Gray composed almost 50% of the sherdware. On the surface there were two Paiute sherds and one historic square type of iron nail.

Arizona F:6:105 is situated on some low gravel ridges 100 yards west and behind the previous site, also on the Nevada side of the river. "On these terraces and on the summit of the ridges are a number of small rock circles or cleared areas in the gravel. These rock rings range from five to nine and one-half feet in diameter and are roughly outlined with small to medium sized boulders rather irregularly spaced" (Baldwin, 1948:53). There were 20 stone circles of this size, one somewhat larger and one rectangular one. Some brief test pits were dug, but no cultural material was encountered and the stone circles "rest directly on the cleared gravel hardpan" (Baldwin, 1948:53).

Arizona F:6:1 and 6:2 are situated nearly three miles southeast of Eldorado Canyon on the Arizona side. These sites consist of several stone circles their diameters varying from 9'8" x 12'6" to 20'11" x 27'. "The unique feature of these sites however, is the presence of numerous petroglyphs pecked on the medium to large lava boulders covering the greater part of the area. These depict both geometric and naturalistic forms and many show excellent workmanship" (Baldwin, 1948:57). Only a few sherds of pottery were found including Topoc Stucco, Topoc Buff, Sacramento Brow, Pyramid Gray and Topoc Red-on-Buff.

Arizona F:6:8 is about one mile south of the two previous sites and is a large site, characterized by sand dunes. "Two long trenches were excavated across the main sand dune area and several test pits dug over the remainder of the site...No signs of houses were noted and occupation appeared to have been confined to a relatively narrow vertical zone from one to two feet in thickness. One circular rock outlined firepit was discovered at ground level "and three others a few incles below the surface. These were all circular in form, from twenty to thirty inches in diameter, ringed with small...fragments, frequently being of broken metates or mortars. No floor areas, remains of posts, or other signs indicative of houses were noticed about any of these firepits" (Baldwin, 1958:60-61).

Lithic data encountered consisted of manos, metates, mortars, pestles, hammerstones, a knifeblade fragment and a single projectile point. More than 1000 potsherds were recovered, both from the surface collection and from the excavation. Most of the sherds were local plain wares, including Topoc Buff, Pyramid Gray, Eldorado Gray with s few sherds of Topoc Stucco, Searchlight Brown, Sacramento Brown, Aquarius Brown and Cerbat Brown. One new type was encountered, tentatively named Cottonwood Gray. Intrusive sherd types consisted of Tusayan Black-on-Red, Deadman's Gray, Deadman's Black-on-Gray and Aquarius Black-on-Gray.

Baldwin's site Arizona F:2:1 is the Willow Beach Site previously excavated by Willis Evans and the CCC under the supervision of Harrington. In the 1936 excavation there were no definite traces of house floors, numerous artifacts were found and a total of six human burials and one dog burial. In Baldwin's discussion of this site, he incorporates some of this earlier material.

> "The present excavations were begun along the north face of previous excavations. A section of this face approximately 25 feet in length was cleared off and utilized as the beginning of a trench which was carried to the north extending across the entire width in three feet (about 1 meter) horizontal sections and approximately one foot (35 cm.) vertical sections. In the limited time during which excavation could be conducted this trench was extended to the north about 15 feet and to a depth of about 8½ feet. Along the river side of the sand terrace, approximately 25 feet northwest of the first trench and at right angles to it, a second trench about 20 feet in width was run into the bank about 15 feet in s similar series of levels... here for the first time in our excavations in the Davis Dam area were found definite evidence of stratifications...deposits containing artifacts, ashes, and other indications of human occupation were found in definite strata down to a depth of more than eight feet" (Baldwin, 1948:69-70).

The site had already been considered by Harrington as a camp area that was used sporadically over long periods of time and for a sufficient stay that burials occurred. Through Jumbo Wash, adjacent to Willow Beach, there is easy access to the hinterland and then from Willow Beach to areas down river. As Baldwin noted there is little land suitable for agriculture near the river at this locale. In Cottonwood Valley to the south there is much more flat land adjacent to the river that could have been utilized agriculturally.

> "Although the present work revealed no signs of houses, the 1936 excavations found an oval area measuring 10 by 12 feet, with a firepit in the center, that appeared to be all that remained of a small hut. Quantities of burnt willows indicated that these might have been used to cover the sidea and roof of the structure. The floor was only six inches beneath the present ground level. A great deal of cultural material, including numerous potsherds, fragments of several arrowpoints, knife blades and scrapers, turquois and shell beads, and a few burnt animal bones were recovered from the floor of the hut" (Baldwin, 1948:71-72).

In the area of the Willow Beach site, but 30 to 50 feet higher, were a number of small rock circles with cleared gravel floors, similar to the others found down stream from this site. In the excavations several firepits were found, one of which was lined with clay, others had rock around the outside of the pit.

> "Cultural materials recovered at this site were more numerous and varied than at any other site excavated in the Colorado River valley, and ranged from Paiute pottery and arrowpoints on the surface to Pueblo and Patayan implements and utensils in the upper four to five feet of deposits and pre-pottery stone and bone implements in the lower levels down to a depth of over eight feet. Stone artifacts were abundant and included metates and manos, mortars and pestles, rubbing stones, hammerstones, hammers, arrowpoints, knife blades, drills, scrapers, spearpoints, large blades, and various types of ornaments, all occurring in the upper levels, and large points, manos and metates, blades, and scrapers in the lower levels" (Baldwin, 1948:73-74).

No pottery was found in the lower levels, which Baldwin considered pre-pottery. A single three-quarter grooved axe was found during the 1936 excavations, but is described by Baldwin in this 1948 report. It is suggested that this probably was a trade item from the southwest. Unworked mammal bones included specimens from mule deer, mountain sheep, jack rabbit, ground squirrel, and possible antelope. Some bone awls were found during the excavations. Shell beads and pendants were plentiful including olivella, abalone, glycymeris, and other materials as tortoise shell, slate, hollow bone, polished feldspar and gypsum.

The several thousand potsherds recovered included "in order of their relative abundance: Pyramid Gray, Eldorado Gray, Topoc Buff, Sacramento Brown, Searchlight Brown, Cottonwood Gray, Topoc Stucco, Aquarius Orange, and Aquarius Brown. Pyramid Gray and Eldorado Gray were by far the most abundant, with Topoc Buff also quite common, particularly on the surface and in the upper level...Intrusive sherds were fairly numerous and included Boulder Gray, Boulder Black-on-Gray, Aquarius Black-on-Gray, Deadman's Black-on-Gray, Deadman's Black-on-Red, Tusayan Black-on-Red, Sosi Black-on-White, and several varieties of Tusayan Corrugated and Shinarump Corrugated" (Baldwin, 1948:78-79).

Baldwin listed the frequency of the occurrence of pottery types by levels: Surface - Paiute ware, Topoc Buff, and Pyramid Gray; Level 1 (surface to 35 cm.) - Pyramid Gray, Topoc Buff, Searchlight Brown, Boulder Gray and Tusayan Black-on-Red; Level 2 (35 to 70 cm.) - Topoc Buff, Topoc Stucco, Pyramid Gray, Cottonwood Gray, Eldorado Gray, Searchlight Brown, Tusayan Black-on-Red, Deadman's Black-on-Red, and Sosi Black-on-White; Level 3 (70 to 105 cm.) - Pyramid Gray, Cottonwood Gray, Deadman's Black-on-Gray and Aquarius Black-on-Gray; Levels 4 and 5 - a few sherds of Pyramid Gray. Below this there were no sherds, except those associated with intrusive burials.

Baldwin includes in his 1948 report notes on the first six burials found in the 1936 excavations and describes the two burials found during the 1947 excavation. Six of the burials were adults, including the one associated with the dog burial, and there were one child and one infant burial.

At the conclusion of his excavations, Baldwin estimated that there was still well over one-half of the Willow Beach Site remaining unexcavated. He recommended further research at this area.

There were a few miscellaneous sites which Baldwin encountered during this 1947 survey and excavation, which he does not describe individually in his 1948 report, but notes only specific artifact types he recovered from them. In this report on his research Baldwin has no estimate on the field days that were involved with the testing of these archaeological sites and no information on the techniques of excavation, or data recovery from sites. Consequently there is no way to quantify the process involved in the removal of the artifacts or the subsequent laboratory analysis. Essentially this is a typical archaeological report of the time period, a descriptive presentation of the data intermixed with theoretical interpretations.

The third excavation of the Willow Beach site was undertaken by Albert Schroeder, at that time, 1950, the archaeologist for the Lake Mead National Recreation Area. Schroeder's description of the Willow Beach area clarifies the appearance of that locale:

> "The site is situated on the east bank of the Colorado River, on a sandy terrace in lower Black Canyon, 15 mi. south of Hoover Dam. The canyon, along this stretch of the river, is lined with rugged mountains and occasionally is broken by side washes that empty into the river. Along the banks on one or sometimes both sides there are a few narrow sand terraces built up by past floods and wind deposition. These are covered with scattered growths of mesquite, creosote, willow and occasional cactus, and the banks are lined with fairly thick concentrations of arrow brush...The practice of agriculture in the immediate vicinity is remote but possible. The few open spots in the canyon are barely large enough to accommodate more than an Indian campsite. The sandy terraces here are from 5 to 30 ft. above the river, most of which are not low enough for crops to obtain subsurface water seepage from the river" (Schroeder, 1950:8).

The field work was done between February 8 and April 14, 1950, by Schroeder and two field crewmen. "Two tests were conducted in the course of the work. The first waa set down and extended to the northweat of the 1947-48 excavations. Cultural material was recovered to a depth of 1.5 m. Below this, tests revealed sterile earth to a depth of 3.5 m. below datum, beyond which no further testing was conducted. The second test was laid out on the southeast edge of the 1936 excavations and it was here that the great majority of material and information was gathered. Excavations reached a depth of 4 m. in the deepest spot, and, throughout the trench, stratigraphy was clearly evident" (Schroeder, 1950:iii. See Figure 3, page 137 of Schroeder's report, for the plan of the excavation showing the 1936 and the 1947 excavations and his own Trenches IV and V).

> "A horizontal grid was used in which each section measured 1 by 2 m. Each northwest-southeast grid line was given a number and those crossing at right angles were designated by letters. The point where two of these lines crossed on the north corner of a block was used to identify the block: for example, B-6, C-6, D-6, etc. The material was removed by artificial levels, each 25 cm. in depth, and the levels were numbered from 1 at datum down to 16 in the deepest test. As these tests were the fourth and fifth excavated in this site, the smaller trench was designated as trench IV and the larger as trench V" (Schroeder, 1950:7).

There was no stratigraphic evidence of soil changes in Trench IV, but a continuous blending of sand and charcoal down to sterile. No evidence was seen that flood waters reached the cultural levels to displace the contents. This may relate to the position of this trench higher up the slope above the beach. "The heterogeneous mixture of the cultural deposit was probably caused by wind action and constant trampling over the site by the Indians during occupation periods. In addition, the presence of quantities of thermal fractured rocks from the cooking and roasting pits which occur through these deposits indicates that the occupational surfaces must have been raked over quite often whenever the pits were cleaned out for reuse" (Schroeder, 1950:9).

Trench IV contained two definite horizons the lower of which was preceramic. According to Schroeder the lower level just above sterile, contained stone implements only, with occasional intrusive sherds in the upper part of this level. Burned animal bone was found throughout both cultural horizons, indicating hunting was a major factor for the groups using this site area.

All material recovered is described by Schroeder and listed in tables according to the level in which it was found. It is further divided by ceramic and preceramic designations, and from his pottery table it would appear that Levels 1 through 3 were ceramic and Levels 4 and 5 preceramic. Worked bone was found in Levels 4 and 5, knives in Levels 1 through 3, a scraper in Level 2, drills in Levels 1 through 3, points in Levels 2 through 5, a pecking stone in Level 4, manos in Levles 2 and 3, a metate in Level 2, oval stone discs in Levels 3 through 5, cooking pits in Levels 2 and 3, shell in Levels 1 and 2, asphaltum in Level 1 and on the surface only, turquoise and steatite. A total of 161 sherds were found in Trench IV in Trench IV in Levels 1 through 3, including Pyramid Gray and a Variant, both Lower Colorado Buff Wares; Boulder Gray, a Moapa Gray Ware; Aquarius Brown and Gerbat Brown, both Tizon Brown Wares; Kirkland B/O, Deadman's B/G, Kirkland Fugitive Red, Kirkland Orange and Deadman's Fugitive Red, all San Francisco Mt. Gray Wares; and Aquarius Black/Gray, a Prescott Gray Ware.

In Trench V the stratigraphic sequence was divided into fifteen layers, designated A through O.

> "It will be noted that the culture-bearing sand and charcoal zones are interbedded with silt deposits of varying thicknesses. These apparently represent the end stage of various floods of the Colorado River. All of these silt strata dip toward the river and are of greater thickness on the river side of the trench. These silt deposits, exceptionally hard, acted as seals for the various cultural horizons that they covered. Due to this fortunate circumstance, there was no chance for material from one horizon to become intermixed with that of another. The history of the site is one of successive Indian occupations interspersed by periods of flooding... Associated bone material in the deposits of Willow Beach does not indicate any environmental change" (Schroeder, 1950:19).

Burnt and broken animal bone was recovered from all layers of Trench V

similarly to Trench IV. Animals identified were antelope, mountain sheep, beaver, chuckwalla, wood rat, cottontail, jackrabbit, tortoise, duck and mourning dove, as well as limited amounts of fish bones. Artifact materials consisted of worked bone, choppers and other percussion implements, knives, scrapers, drills, a graver and a reamer, projectile points and blades, pecking stones, hammerstones, manos, metates and some raw materials as hematite and hardened clay. Roasting pits were found in Layers B, G, F, G, J, and O; cooking pits in Layers B and G, and fire pits in Layers B, G, and J. Several burned timbers were recovered from Trench V, some of which were imbedded in an upright position forming a kind of arc, and there was one possible posthole.

A total of 1,260 sherds were recovered from Trench V and were found only in Layers B and G, and 160 sherds were encountered in a "pier test" dug adjacent to Trench V. In Layer C of Trench V were found Lino Black-on-Gray, Boulder Gray, "Utah" Gray Ware, Logandale Gray Ware, Gerbat Brown and Verde Gray pottery types; in addition to these types in Layer B were Aquarius Black-on-Gray, Aquarius Brown, North Greek Gray, Paiute Ware, Sandy Brown, Aquarius Orange, and Pyramid Gray. Similar pottery type distributions were found in the "pier"test with one additional ware, Moapa Black-on-Gray.

Schroeder divided the cultural material from both trenches into various horizons, correlating the recovered artifacts for Trench IV with the stratigraphic sequences derived from Trench V. In Trench V he determined four stone horizons and three ceramic horizons. Four radiocarbon dates were obtained from charcoal recovered in Trench V and they gave a time span from about 250 B.C. to about 1450 A.D. There is always the possibility, as Schroeder points out that river water flooding the site could have contaminated the charcoal with other organic materials, so the dates may have been affected.

In this report Schroeder reviewed and compared the data recovered from the previous excavations and his own. He pointed out that while the foreman of the 1936 excavation had worked on previous archaeological sites, his notes were mainly notes of the daily record of recoveries with some sketches or remarks. There is no detailed record of this 1936 work.

In discussing Baldwin's work in 1947 he reported that the manuscript "on these excavations was preliminary and as a result did not contain statistical and detailed analyses. The material recovered consists mainly of potsherds and a few artifacts which were treated in a general discussion along with a quantity of the material from the 1936 excavations...Since there are no notes or profile drawings on the 1947 excavations, and none of the material was catalogued, no direct comparisons are possible...None of the discussion on stratigraphy, however, was restricted to either one of the two trenches excavated, and because of this it is impossible to carry the profile of the 1936 trench through the 1947 excavations into the 1950 Trench IV area" (Schroeder, 1950:71).

In these comparisons Schroeder is attempting to correlate all the recovered artifacts from these excavations and draw conclusions as to the aboriginal utilization of Willow Beach through time by various prehistoric groups.

In 1949 Garr Tuthill, Gurator at the San Diego Museum of Man, accompanied by Louis Quayle, a museum assistant at the same institution, did an archaeological survey of the Lower Davis Dam Reservoir Area. This survey was done at the request of Dr. Erik Reed of the NPS, Santa Fe, New Mexico. The purpose was to survey the area below where Baldwin ended his work at Cottonwood Island, the remainder of the distance to Davis Dam. The work was done from May 4 to May 12, 1949, utilizing a jeep for access and walking the banks

on both sides of the river. One area approximately 4 to 5 miles long, they were unable to reach was on the Nevada side of the river just above Davis Dam, where the Newberry Mountains descend close to the river. An additional area that was not surveyed lay south of Tyro Wash on the Arizona side of the river. "Several very large arroyos empty into the river here in a stretch of a mile and a half or two miles. Separating the arroyos are the remnants of an old and high river terrace that will be well above the high water mark when the lake is flooded. Experience with similar but smaller areas downstream convinced us that the lack of a flood-plain suitable for agricultural pursuits was not conducive to any large settlements or camps" (Tuthill, 1949:2). Their assumption was the prehistoric people of the area were agriculturalists and since in this section of the Golorado River between the south end of Cottonwood Island and Davis Dam there were few broad flood plains, there would be no permanent settlements close to the river. "It seems probable that with a large, flat, fertile valley around Gottonwood Island which could be farmed easily and with the same conditions existing below Davis Dam Site, the area which we surveyed was used largely as a travel route (and) the few sites we found represented small temporary or over-night camps" (Tuthill, 1949:2).

> "Twenty-one sites that will either be flooded or very near the high water mark were found and recorded. They can be grouped more or less as follows: 1. Lithic sites with no architectural features. 2. Lithic sites with Malpais rings, house rings. 3. Lithic and pottery bearing sites, no architecture. 4. Sand dunecamps. 5. Trail shrines. 6. Gaves used for living quarters and storage. 7. Buried hearths. All of the sites are small and none of them warrant excavation or further survey...
>
> The pottery-bearing sites have sherds of the types called Yuman II and Yuman III by Rogers. Baldwin used Golton's classification and called similar sherds he found Patayan. After examining Baldwin's sherds at the National Park Service headquarters in Boulder Gity, Nevada, we feel that ceramically speaking, at least, Patayan and Yuman are basically one and the same thing" (Tuthill, 1949:3).

A single hearth was found exposed in the river bank at a depth of three and one-half feet. It was felt by Tuthill that this was one of many that had been covered by floods over time by the Colorado River, and the depth was not an indication of antiquity. On river terraces 25 to 50 feet above the river there are "signs of occupation or of having been used as workshops. Percussion fractured rocks and cobbles and chips are often found even when there are no signs of house rings or depressions... We found no sherds in association with any of the house ring sites found in the lower Davis Dam Area and we came to the conclusion that these are non-ceramic site...Of the two caves showing signs of occupation, one had Yuman II sherds and the other Yuman II and Yuman III. Two storage caves with Yuman II pottery were also found" (Tuthill, 1949:4-5).

Their conclusions for the survey of this section of the river was that there was little use of the area close to or along the river, except as a travel route. They concluded that the sites they recorded were temporary camp sites and that much of the archaeological evidence on the banks of the river had been buried or destroyed by flooding.

In the summer of 1949 Barton Wright, a graduate student at the University of Arizona, Tucson, conducted an archaeological excavation at Catclaw Cave under the auspices of the University of Arizona Archaeological Field School, with an NPS agreement to extend to them the San Diego Musem of Man Antiquity Permit. The work was carried out between May 30, and July 15, 1949. Three University of Arizona students assisted in the project. "The site is located on the Arizona side of the river fifteen miles downstream from Hoover Dam, and one mile north of U.S. Geodetic Survey Cable 17. The cave is 200 yards from the Colorado River, the floor is 648' above sear level" (Wright, 1949:1). There is some confusion in Wright's numbering system and description of Catclaw Cave relative to the Willow Beach site. Baldwin through his system had assigned the number Arizona F:2:1 to the Willow Beach Site in 1943, but in 1949 Wright utilized the same number to designate Catclaw Cave. Schroeder in his 1950 publication on the excavation of Willow Beach stated that the site is 15 miles downstream from Hoover Dam, although Brooks (1977) in a boat survey on the river recorded the Willow Beach Site at approximately nine miles downstream from Hoover Dam. Wright in his detailed description of Catclaw Cave said that it was between four and five miles downstream from the Willow Beach Site. Wright's positioning of Catclaw Cave as approximately fifteen miles downstream from Hoover Dam and four to five miles below Willow Beach concurs with Brooks' recent estimate by river of the Willow Beach Site at about nine miles below Hoover Dam.

Catclaw Cave was excavated to recover any available material before the imminent rise of waters impounded by the construction of Davis Dam. At the time Wright conducted this excavation, the cave was considered potentially significant Payayan site on the river.

> "The cave is an opening in the base of a basalt cliff 12.30 meters wide by 12.40 meters deep and 3.4 meters high at the mouth. There were strong evidences of occupation on the floor of the cave and along the banks of the nearby river. The method used in excavation was a test trench put through from the foot of the talus slope in front of the cave to a sterile bench in the rear of the cave. With the completion of this test trench and the determination of the depth of culture-bearing material, a test pit was sunk to determine the depth of the sterile deposits. The cave floor was not reached in six meters but the test pit was abandoned because of the danger from sloughing walls. Following this a broadside was started at the beginning of the talus slope, and carried throughout the cave, clearing all culture bearing material. The waste was backfilled into the excavated areas" (Wright, 1949:2).

The cave fill showed definite changes in that the surface layer was wind blown silt (Level 1), below which lay clays, silts, sands and fine gravels (Level 2). These layers had been cut through by fire hearth pits and caches. The clays are also evidence of occasional flooding of the river into the cave, and these intermixed with wash detritus extends 6.5 meters to the bottom of the test pit that was dug. Level 1 is the only culture bearing layer and is apparently less that 1 meter in depth. The areas excavated were divided into the following horizontal divisions: talus slope, platform, terrace, talus cone, bench, chamber and chimney.

Several types of pits and/or hearths were found, including a feature consisting of postholes with a concave central depression, which is referred to by Wright as a "lodge". "The depression measures .85 cm. by 1.00 cm. with the longer side oriented parallel to the bench at the rear of the cave and cut partially into it. There are postholes at each corner and all are extremely shallow with an average depth of .10 cm. and a diameter of .08 cm. The northeast and southeast postholes were rock-lined...The northern edge of the floor still retained a fragment of rough, thin, mud plaster. A partially burned yucca pod and a sherd of Pyramid Gray lay on this plastered area" (Wright, 1954:18). There were five pit hearths, nine basin hearths and four grass lined pits, none of which occurred in the lodge. None of these hearth types were found during the Willow Beach Site excavations.

Stone artifacts included scrapers, projectile points, knives, drills, spokeshaves, choppers, pulping planes, metates, manos, hammerstones, and possible polishing stones. Turquoise specimens included a bead and an unworked piece. Hematite staining was found on most recovered artifacts and one hematite cache of 15-20 large lumps occurred in a pit, stored in a grass bundle. Few of the lithic artifacts recovered were sufficiently diagnostic for comparison with the Willow Beach Site series. "There were more unbroken artifacts of bone from the cave than any other material. These artifacts were generally in excellent condition. In some cases the tools still retained dried flesh" (Wright, 1954:33). The bone artifacts included fleshers, bone awls, an antler flaker, bone tinklers, hoof tinklers, a bone snare pin (probably a fish gorge), bone die, a bone tube, a bone spatula, a bone disc and numerous bone fragments showing polishing or drilling. Only three olivella shell beads were found.

Six clay figurines were found in the deposit, which were divided into two types: "The first type is represented by two specimens of tubular, untempered clay. Their shape is that of an elongated wedge with the head at the widest end. The eyes are represented by two parallel incisions at either edge close to the top of the head, and are separated by an applique of pinched clay for the nose. One specimen is that of a female fingure broken just below the appliqued breasts...The second type, represented by a single specimen,...is a rounded fragment of unfired clay with one end pinched out to form a curved beak-like nose. One side of the nose is marked with a black bull's-eye, while the other side is decorated with a hatchure of two sets of parallel black lines crossing at right angles. The neck portion is decorated by two parallel rows of punctate marks extending across the front and around the sides but absent at the back" (Wright, 1954:42). The three other figurine fragments are incomplete.

In addition to the figurines of unfired clay, 24 fragments of unfired miniature pottery vessels were found. Some of these were decorated by incising or painting, some showed fingerprints and others appear to have been worked after the clay was partially dried out, so that the surface is heavily cracked. One possible interpretation is that these were made by children, either as play objects, or as part of their learning behavior.

Perishable material encountered in the excavation were fragments of string from yucca fiber, willow bark, cotton, and hair and skin. Basketry was fragmentary, with the exception of one complete coiled basket. Fragments of two plant fiber sandals, bark bundles, an arrow shaft, a fragment of fringed hide belt, fragments of sewn hide, and a variety of plant remains many of which showed evidence of cutting or chewing.

A total of 1,078 sherds were found, which are listed in order of relative frequency of occurrence Pyramid Gray, Cerbat Brown, Parker Buff, Aquarius B/Gr, Boulder Gray, Aquarius Brown, North Creek Gray, Sandy Brown, Parker Stucco, Deadman's Gray, Deadman's B/W, Boulder B/Gr, and one unidentified B/W. Most of the sherds in the deposit came from either the talus slope at the cave entrance or near the consolidated bench at the rear of the cave. The sherds are similar in frequency of occurrence and types to those found by Schroeder at Willow Beach.

The flora and fauna recovered from the excavations was extremely varied and included the fossil mandible (found in a rat's nest at the back of the cave) of a large sheep, "larger than any fossil or recent sheep so far known in North America" (Wright, 1954:59) and the horn core of a bison, which apparently was a trade item. The modern mammals and birds were similar to those found at Willow Beach. Of unusual interest is the amount of fish remains, which include over 375 bones representing two families and several species of fresh water edible fish. This is the most abundant evidence of fishing by the aboriginal inhabitants found at any prehistoric site recorded in the LAME area. Seven corn cob specimens were identified by Mangelsdorf, some of which represent almost pure maize. There is no comment by Wright describing an area in the vicinity of Catclaw Cave that could have been utilized agriculturally, so presumably these specimens were brought into the river region.

The analysis of the material from Catclaw Cave was difficult as there was no soil stratigraphy in the deposit, but typologically Wright divided the artifacts into two groupings.

> "The pottery assemblage...is identical with that found in Layer B (Willow Beach Phase) at the stratified site of Willow Beach by Schreoder. There can be no doubt in assigning Catclaw Cave to the Willow Beach Phase on the basis of pottery alone. The second grouping, one type of figurine, pseudo-pottery, and the bone die, all have similar counterparts among Basketmaker artifacts...In addition to the preceding groups, a third group is composed of artifacts which probably represent the perishable material accompanying the Willow Beach Phase... A brief summary of the history of the Cave is one of intermittent occupation over a considerable span of time. The cave was probably used as an animal habitation at an early date... There is more evidence to suggest use of the cave by Basketmaker peoples from the Virgin Branch of the Western Anasazi working southward from the Virgin River some time prior to 750 A.D. Their use of the cave appears to have been for other than living quarters, because of the lack of utility items and the presence of numerous painted non-utility artifacts. Later an indigenous group responsible for the manufacture of Pyramid Gray appears to have resided in the cave, and either traded with or was visited by members of the Cerbat Branch of the Payayan to the east. This phase has been designated the Willow Beach Phase dated from 900-1100 A.D. by Schroeder at Willow Beach. Following this, there is no evidence of occupation until modern times" (Wright, 1954:70).

In 1973 Richard H. Brooks, NAS Director, conducted a survey on a number of proposed development projects for NPS within LAME boundaries. In addition to the survey of the proposed development project sites, other areas with high recreational useage were included. The work was conducted intermittantly between 1971 and 1973 related to the varying priorities of the construction projects. The following areas surveyed during this research fall within the Lake Mohave Region: Eldorado Canyon Landing or Nelson's Landing, Cottonwood Cove, Christmas Tree Pass, Katherine Landing Residential Area, and Willow Beach. Field crew varied from three to five individuals, depending upon the area to be surveyed. Construction or other project areas were intensively surveyed and surface collections were made of sites where necessary.

Areas of high recreational use were surveyed in a controlled reconnaissance fashion.

Material found in the Nelson's Landing area consisted of a historic cemetery relating to the mining activities at Nelson in the late 1800's or early 1900's and a number of archaeological sites, including possible aboriginal trails, house circles, concentrations of lithic workshops and a possible historic circular rock alignment. "The lithic materials from these sites consisted mainly of a volcanic cream-colored silicious material. The rocks utilized in the rock alignments and house circles for the most part are basalthic boulders...In this area there appears to be a combination of living areas associated with lithic workshops. There was no ceramic material located...It was noted that all of the lithics collected here were formed through percussion flaking and there was no evidence of pressure flaking" (Brooks, 1974:9).

Cottonwood Cove is south of Nelson's Landing on the west side of Lake Mohave and east of the town of Searchlight, Nevada. No historic sites were encountered during the survey, but three archaeological sites were recorded. The three sites included a circular depression in the desert pavement with an associated lithic scatter, and two small shelter sites. Isolated lithic waste flakes were found on the terraces between the shelter sites and Cottonwood Cove. Additionally stone circle sites have been reported in the area by an avocational archaeologist and have been recorded since the report on this survey. Artifact material consisted of a metate, two possible Paiute sherds and numerous waste flakes.

The portion of LAME located in the Newberry Mountains on the west side of the Colorado River and north of Davis Dam is usually referred to as the Christmas Tree Pass area. The sites that were observed in the Christmas

Tree Pass area on this survey are off the LAME dirt access road which connects to Nevada State Highway 77. During the brief reconnaissance in 1973 "one large shelter site was noted on the south side of the road within the Park boundary. The midden area extends approximately 30 meters along the base of the cliff and about 10-15 meters outward from the cliff. The surface midden has a dark black texture with a light scattering of lithic material visible" (Brooks, 1974:21).

It is also in this same region that the Grapevine Canyon petroglyps are located. There are several additional vandalized shelter sites not too far distant from the locale of the petroglyphs. The large shelter site recorded during this survey had been disturbed by campers, but apparently not vandalized at the time of the research.

The area in the Katherine Landing Residential Section was extensively surveyed at the site of the new sewage disposal area and no historic or archaeological materials were encountered.

> "Two miles north in the present residential area adjacent to the lake two projections of the former terraces extend into the lake. On each of these a site was located. These were given temporary numbers, Arizona Katherine Landing A and B. Site A consisted of two badly distorted circular rock features in association with a minimal lithic scatter. This site is 100 meters west of Lot No. 36 in the residential area. The features have been disturbed through recreational useage.
>
> Arizona Katherine Landing Site B is located directly across the small cove from Site A. This included four circular rock features, of which two were badly distorted also through recreational activities. Again a minimal amount of lithic materials were associated with this site...A few waste flakes were collected and one chopper. The chopper was made from volcanic material and percussion flaked" (Brooks, 1974:24-25).

No archaeological materials were found in the proposed construction area of Willow Beach, although on the terrace above the campground area "a series of house circles were located. These were situ

overlooking the river and a number of them had been badly d in the more inaccessible areas are in relatively intact condition. Some scattered waste flakes were found in the vicinity, although no pottery ware was encountered" (Brooks, 1974:52).

"On August 30th, Mr. and Mrs. J.F. Schulte and their children discovered a human skeleton eroding out of a sand bar approximately a mile below Willow Beach" (Maxon, 1971:1). On September 2, 1971, James C Maxon, then the NPS archaeologist for the LAME area, excavated the burial, accompanied by the Schulte family and Ranger Schippleck, as well as Maxon's two sons. "The burial site was on a long sandy beach on the Nevada shore of Lake Mohave just over a mile below Willow Beach...This site had been previously designated as Arizona F:2:3 in the Lake Mead Archaeological Survey...The burial itself was located about 60 feet from the shoreline (water level 635.20 feet) and was between the high and low waterlines. About half of the skull was exposed above the level of the sand and the rest of the skeleton was just below the surface. The individual was in a flexed position, lying on the left side...In general, the bones were in poor condition, and were quite fragmentary" (Maxon, 1971:1). It was determined that the skeleton was that of an adult male individual. A number of wasteflakes were encountered in the vicinity of the burial, in addition there were two possible polishing stones.

"A small collection of pottery was made from the sand bar. Most of the material appeared to be Parker Buff. There was, however, one sherd of a corrugated Pueblo Ware and several possible sherds of Pyramid Gray" (Maxon, 1971:2).

In March, 1976, Kathleen Quinn, working under the sponsorship of NPS Western Archaeological Center, Tucson, conducted an archaeological survey on the Nevada side of the Colorado River south of Nelson's Landing.

She was assisted in the field by three people, also from the Western Archaeological Center. Field work was conducted between March 16 through 26, 1976, with an additional five-day extension. The purpose of the survey was to study the "feasibility of developing a marina along the west side of Lake Mohave, just northwest of Fire Mountain. The proposed marina would replace the facility at Nelson's Landing, which was destroyed by flood in 1974... The survey area is on the west side of Lake Mohave, about one and a half miles south of Nelson's Landing in Clark County, Nevada" (Quinn, 1976: 1 & 9).

Utilizing the environmental background of the area, Quinn divided the survey locale into six units

> "on the basis of terrain and vegetation. These units appear to correspond with differences in the archaeological remains. Sites and isolated artifacts were found in Units 1, 2, 3 and 6. Isolated artifacts were found in Unit 4. Unit 1...is the area along the lake, consisting of an upper and lower, border plateau...Five sites were found in Unit 1; three were lithic sites, one was a lithic site with features and one was a multi-component site (including historic and prehistoric materials)...Unit 2 is west of Unit 1 and...consists of ridges, varying in width from 10 meters to 40 meters, separated by washes draining northeast into Lake Mohave. At the eastern edge the ridge slopes steeply to the shoreline...twenty-one sites were found in Unit 2; 14 were lithic sites and seven were lithic sites with features...Unit 3 is on the south side of the jeep trail and west of the plateaus above the lake... A large wash, draining to the south, runs somewhat perpendicular to the eastern edge of this unit...Although Unit 3 was not completely surveyed, seven sites were recorded; six were lithic sites and one was a lithic site with features...Unit 4 consists of systems of linear ridges of varying height and breadth, some running uninterrupted from the western to the eastern boundary...Only isolated artifacts were found in this unit... Unit 5 includes several broad washes divided by narrow groups of ridges...No prehistoric sites were recorded in Unit 5, but several mining claim markers were found...Unit 6 contains three distinguishable landforms: deep washes, narrow linear ridges and more circular hills in front of the mountains in the northwest corner of the survey area...Lithic sites were recorded in Unit 6" (Quinn, 1976:13-15).

Fifty-three sites were recorded during the survey, thirty-six were

prehistoric and seventeen were historic mining claim markers. "Seven sites are classified as lithic scatters covering a small surface area; five sites are lithic sites with a medium to dense artifact assemblage in a small area; five sites consist of light to medium lithic debris covering a somewhat larger area; eight lithic sites cover a large area, with a medium to dense artifact assemblage; nine sites consist of lithic debris and features, such as rock circles, and two sites are multi-component, including both prehistoric and historic material" (Quinn, 1976:23). Quinn has divided the rock circles into two possible uses, the larger ones for habitation and the smaller ones as hearths. The appearance of the rock circles vary in that "some are defined as boulder alignments with cleared interiors and several are cobble alignments with slightly depressed, cleared centers. Other circles are found on well-developed desert pavement, with cobbles defining the circle but with no variation between the exterior and interior surfaces...A feature was found at Sites 11 and 31...along the crest of a ridge with a gentle slope that is cleared of desert pavement and which, in profile, appears to be scooped out of the side of the ridge. Four of these features were recorded, two at each site. One of those at Site 11 had very soft soil beneath the surface and included within its limits a small basalt boulder with large flakes around it. Cultural material was concentrated around these features" (Quinn, 1976:23).

In interpreting the material recovered the activities were:

> "divided into three categories: (1) quarrying (selection by people of materials for making tools), which might be represented in the artifact assemblage by large quantities of cobble fragments and cortex flakes; (2) preparing the raw materials for making tools, including removal of cortex and fashioning cores to produce specific types of flakes or bifaces, which later would be made into scrapers, knives, gravers and other tools, and (3) tool manufacturing, evidenced by relatively small thin flakes. All of these activities might be found within a single site...

> Bifacially flaked artifacts, hammerstones, cores and a few utilized flakes were also recorded at some of the sites. No prepared tools, such as projectile points or scrapers, were found. Several possible choppers and chopping tools were observed, but a positive identification was not possible. One metate fragment was found...The lack of finished tools indicated a preoccupation with quarrying at the sites, the tools being finished elsewhere.
>
> Pottery was found only at Site 48. The pottery was concentrated in two areas at the northern end of the site, one with more than 30 sherds and one with three. All are tan sherds, some with orage visible in the matrix" (Quinn, 1976:29).

In conclusion Quinn states that "the sites generally represent limited activities, with quarrying and preparation of raw materials the main concerns. Evidence of habitation areas at some sites, the amount of lithic debitage and the lack of habitation units at other sites suggests a more intricate integration with the environment than is at first discernible" (Quinn, 1976:30).

In July, 1976, a Bureau of Land Management (BLM) Clearance Level Class III survey was conducted in an area on the Nevada side of the Colorado River for the BLM Las Vegas District Office. The work was carried out by R.H. Brooks, NAS Director, as principal investigator. "The archaeological survey was conducted in the Fort Mohave area, located in the southernmost tip of Clark County, Nevada, on the west side of the Colorado River. Bullhead City and Big Bend are situated on the east side of the Colorado River in Arizona, the latter city directly across from the project area" (Brooks, 1976:4). Sixty man days were utilized in completing the field work and an additional 17 man days were used for laboratory analysis and report preparation.

The purpose of the survey was for clearance of the land for possible transfer from the BLM to the State of Nevada. "The project area was to be investigated 'at the Nevada BLM's clearance level #2 (Reconnaissance Survey)', in that only two quarter sections, the northwest and one-quarters, were to be surveyed in each section with the Fort area. Within each selected quarter section the survey was to be conducted... at the Nevada BLM's clearance, Class #3, Intensive Inventory Survey. This requires that the survey crew walk parallel transects close to 10 meters apart, where possible" (Brooks, 1976:21). In the numbering and mapping system "Section numbers were utilized as sample unit numbers and these were broken down into their four quarters or quadrants; the northwest quadrant being 1, the northeast quadrant, 2, the southwest quadrant, 3, and the southeast quadrant, 4. For each section in the project area...two quadrants were surveyed, the northwest (1) and the southeast (4)...All sites were evaluated by the BLM Cultural Resource Evaluation System in the field to determine their cultural significance" (Brooks, 1976:25).

Within the survey area the "project terrain was divided into two physiographic areas, the Colorado River flood plain, which contained dense growths of vegetation, and the alluvial fan sloping from the Newberry and Dead Mountains towards the Colorado River valley, with a sparse vegetation cover...On the second river terrace above the flood plain a number of historic sites are the results of the BLM leasing land to small ranchers for cattle-grazing in the adjacent flood plain" (Brooks, 1976:67). On the second terrace overlooking the flood plain there is a small historic cemetery in a privately owned section of land. Prehistoric sites on the second terrace consisted of workshop areas, cobble waste areas, small circular cleared, and cleared areas with rock outlines. There was a limited amount of pottery and the lithic materials were locally derived. "The prehistoric sites found on the alluvial fan area were situated on the ancient river terrace remnants. These sites were...two lithic quarry workshop areas with associated fragments of a ceramic olla" (Brooks, 1976:68) and seven lithic quarry workshops.

During the survey of the quadrants no sites were found in the river flood plain which was covered by dense growths of plants, except where the levees were located. "The second river terrace, which is the lowest extension of the alluvial fan just above the flood plain, contained all the historic sites located during the survey...The prehistoric sites on the second terrace consist of lithic quarry workshops, lithic scatters and concentrations and some outline features. There were isolated finds both of ceramics and lithics recorded in these survey quadrants...No diagnostic artifacts were encountered among lithics of these quarry workshops. There is no indication that the quarry workshops have any great depth or can be related to the creation of the river terraces from which these ancient remnants were derived. Ceramics were found at two of the workshop areas on the terrace remnants and other sherd ware was found as isolates in the upper alluvial fan area" (Brooks, 1976:69-70). Although collecting of material was not an integral part of this survey, some data was brought in for labortory analysis.

> "Fifty-nine sherds of pottery were recovered during this survey. Fifty-two of these sherds are of Lower Colorado Buffware. Eleven sherds exhibited a stucco finish, characteristic of this ware. Lower Colorado Buffware was made by Yuman groups along the Lower Colorado River and Schroeder (1951) dates it at pre-900 A.D. to post-1900 A.D. Seven of the sherds recovered are of Tizon Brown Ware at about 700 A.D. to 1890 A.D.
>
> Lithic materials collected during the Fort Mohave survey are characteristic of a percussion flake and tool technology. Lithic material consists mainly of large percussion flakea recovered from cobbles, randomly flaked cobbles and cobbles exhibiting minimal unifacial and bifacial flaking along edges formed by percussion. Microscopic utilization evidnece, when present, was of battering. Quarry material consists of several varieties of quartz including chert, chalcedony and quartizite. A few objects were made from porphoritic igneous material" (Brooks, 1976:71).

The most recent archaeological research in the Lake Mohave region, south of Hoover Dam was a survey conducted intermittantly between February and March, 1977, by the Nevada Archaeological Survey, Southern Division, University of Nevada, Las Vegas. R.H. Brooks served as principal investigator with a field staff of four individuals, not all of whom went on each field trip. "There were a total of fourteen man-days utilized during the field project, involving four separate trips up the river, and over 12 man-days used in the laboratory and report preparation" (Brooks, 1977:1). The archaeological inventory for the Bureau of Reclamation consisted of a reconnaissance along the Colorado River between Hoover Dam and Willow Beach "on both sides of the river to the height of the 800' contour line. The survey was...conducted from the level of the existing dammed river surface. All arroyos were...examined for both historic and prehistoric remains and the cliff faces for potential aboriginal shelter areas and rock art sites" (Brooks, 1977:1).

The different survey trips were designed to check the river at varying levels dependent upon the amount of water released from Hoover Dam. As a result of this method of conducting the survey, one site was recorded that is covered during normal river high water levels.

"Prior to the construction of Hoover Dam, itself, apparently no archaeological survey had been conducted in the Black Canyon area. This area is referred to by G.C. Baldwin in his 1943 survey prior to the construction of Davis Dam. He stated in a manuscript written for the National Park Service that 'the 1943 survey and the 1947-48 excavation program were confined to the section of the Colorado River valley lying between Willow Beach and Cottonwood Island. Above Willow Beach the rather sheer walls of Black Canyon and the more or less complete absence of benches or other open areas limit the possibility of permanent settlements having been located in that section' (Baldwin, 1948:8-9)" (Brooks, 1977:2).

Utilizing a pontoon boat for access all arroyos or tributaries entering the Colorado River, terraces, benches and cliff faces were explored. "Starting from the Hoover Dam and proceeding systematically down river, both sides of the river valley were surveyed on foot. The precipitous cliff walls in many sections of the Black Canyon prevented possibility of survey or aboriginal prehistoric utilization. Landings were made wherever the terrain permitted and the survey crew would then proceed to walk up each arroyo, explore each sand bank and check the terraces and arroyos as far as the 800' contour...Where the arroyo mouths were wide at their entrance to the river, a number of 10 meter wide transects were utilized to cover the accessible land surface...The mile markers on the cliff of the Black Canyon between Willow Beach and Hoover Dam served as a basic division markers for locating the various arroyos, sand bars, potential shelters and other features investigated" (Brooks, 1977:6-7).

A total of thirty-one localities along the river were intensively surveyed, and:

> "four archaeological sites were located. There were two additional locales, (one containing an isolated broken metate with associated waste flakes) considered as having archaeological potential. The archaeological content of the four sites was meager, with limited amounts of sherdware, occasional waste flakes and some utilized cobble material. One site, Willow Beach #2, contained buried hearths that were exposed just at the river's edge at high water, and during one trip at low water, a variety of artifact materials were recovered, i.e., scraper, knife tip, hammerstone, chopper and a sherd. This site, because of its proximity to Willow Beach proper, can be singled out from the four sites recorded, as having potential archaeological significance...In addition to the four archaeological sites and potential archaeological locales, a single isolated waste flake was observed and a unifacial mano was recovered at separate locations along the river.
>
> The Canyon contains a number of historic features, which were noted, as the ringbolts in various areas along the river. These ringbolts were used to winch steamboats up the ri to the construction of Hoover Dam"(Maxon, 1972).

"Several arroyos contained prospect holes and associated mining equipment. Particularly evident is the historic gauging station and catwalk related to the construction of Hoover Dam. Activity related to dam construction includes also the remnant of a single sonte building marked on the topographic sheet as a ranger station. An adjoining arroyo had been heavily quarried to procure rock for the construction of the ranger station and there is a trail leading to and from it" (Brooks, 1977:13-14).

The sherd ware recovered was identified in the laboratory as Colorado Buffware, Tumco Buff, Parker Buff, Pyramid Buff and a probable Pyramid Gray. Except for the grinding stones, metate and mano, the lithic artifacts and waste flakes were made from local materials. All the cultural data encountered are of the types that fall within previously established patterns for this area of the Colorado River.

This completes the resume section derived from the Lake Mead Recreation Area overview for the National Park Service by Brooks et al (1977).

Schroeder in 1951 had conducted a spot check survey for the National Park Service along the Colorado River from below Davis Dam to the International Border. Fifty-four sites were visited within the area which was to be destroyed by leveling and farming operations. Only one site was recorded that is in an area close to the present study, while a group of three others are located some distance downstream. The first, F:14:7 is described as a petroglyph site away from the River with no associated ceramics. The lower cluster, L:2:8, L:2:7 and L:2:6 are described as being located on the floodplain, near the river bank and in dune area. The prevalent pottery type found in association with them is the Parker Series with some indication of unspecified intrusive ceramic ware. Basically this survey revealed a number of farm and trail camp sites, with an absence of architectural features. "Aside from hammerstones and a few other occasional artifacts such as knives, scrapers, worked sherds, shell fragments, and metates, little material cultural was recovered. The general lack of datable intrusives in the river valley hindered attempts to develop any sort of chronology for the entire area, and the paucity of cultural remains, aside from

ceramics, minimized the possibilities of correlations with neighboring cultural groups to a large extent. In general, however, the data resulting from the survey indicate the prehistoric inhabitants of the lower Colorado River lived much in the same manner as the historic Yuman tribes located on the river" (Schroeder, 1951:50). Schroeder felt that the prehistory of the lower Colorado River peoples could not be determined and tied into the historic groups encountered in the area, until a stratified site was found in the area and excavated, allowing the prehistoric and historic ceramic wares to be correctly assessed.

Archaeological research by the NAS along the Colorado River was conducted for the Bureau of Reclamation through the National Park Service, between 1968 and 1970, and involved a survey along both banks of the river from Davis Dam to the International Border. An individual project within this research, was a pipe line survey in 1970, where the line crossed the river north of Needles on the Fort Mojave Indian Reservation. The pipline survey was incorporated into the overall project report. Over 60 sites were located on the Arizona side of the Colorado River between Parker and Blythe in the Colorado River Indian Tribes reservation where land was in process of being developed from agriculture. The sherd material from this survey is housed by the Tribal Council and has not been studied in detail as yet.

In 1973 the NAS conducted a preliminary survey for the Bureau of Reclamation, through the National Park Service, along a proposed transmission line on the east side of the Colorado River, which extended from Boulder City, to Davis Dam and Parker, Arizona. The archaeological mitigation of the sites reported in the preliminary survey was completed for the Bureau of Reclamation in 1975/76. The principal site areas are located 4 to 5 miles to the northeast of Bullhead City, Arizona, and on the western slopes of the Black Mountains, with the valley floor of the Colorado River approximately five miles distant. The thirteen sites under mitigation consisted essentially of surface lithic scatters and concentrations of possible quarry material. No depth was found during the

testing of any of these sites. An intensive study was made of the thinning and grinding of lithic edges and the striking platform shapes. "The results of this analysis showed that no consistent method of platform preparation was evident. Some evidence of thinning was present along the edges of some platforms. The platform analysis indicated that the technology of construction was random as compared to a patterned mathodology of artifact construction. Measurements of platform size in relation to flake size resulted in no conclusive evidence except that the average platform size decreased with the decrease in flake size" (Larson et al, 1976:24). Pottery sherds were recovered from one site and consist of various types of Lower Colorado Buffware, and possibly Tizon Brownware. Dating of these types of sherdwares ranges widely extending from 700 or 800 A.D. to post-1900 A.D. so that it was "impossible to pin down a time of manufacture of use of this types of sherdware in this section of the Lower Colorado River region (Larson et al, 1976:31) The lithic materials provided no bases for a chronological setting and with no depth to the sites, no further analysis could be made, except postulations as to use patterning by aboriginal groups.

In 1974 the NAS did a preliminary archaeological survey of a proposed transmission line for the Southern California Edison Company. This survey extended from the Nevada/Utah border through the Eldorado Valley to the Fort Mojave Power Plant and from there about one mile north of the northwestern boundary of the present Fort Mojave survey area to the Calfiornia border. In the section of this survey adjacent to the study area, no sites were encountered.

In the summer of 1976 the initial inventory of the Fort Mojave area was completed for BLM and the report on this investigation is on file in both the Nevada State Office and the Las Vegas District Office of the BLM. Additional research was conducted in the spring, 1977, by the UNLV Archaeological Field Class, under the supervision of R. H. Brooks, in a small area west of the Fort Mohave project area. At the same time the terraces, the prehistoric and historic sites previously recorded were re-examined.

ETHNOLOGICAL REVIEW OF THE MOJAVE*

TERRITORY AND ENVIRONMENT

"Mohave Valley, the "core" area described by Kroeber, takes its name from the people who have lived there for at least the past three centuries. The valley's southern limits lie just south of Topock at 114 32' west and 34 40' north, a point known to insurgent Americans as "The Needles" (a series of narrow low pinnacles) and to the Mojave as "huqueamp avi" ("where the battle took place") (cf. Sherer 1965:71). The northern edge of the valley lies near Bulls Head Rock at 35 15' north and 114 34' west (Castetter and Bell 1951). The western border of the valley lies in Nevada and California, its eastern border in Arizona. The entire valley is a natural flood plain, which before extensive dam construction allowed the Colorado River to swell considerably during the spring and early summer. The flood waters played an important part in early Mojave subsistence patterns and will be treated in greater detail later.

A description of the valley itself does not necessarily set the limits of the Mojave occupation range (Map 3). Kelly (1934; also in Stewart 1966) provides a map which extends the Mojave range north along the Colorado, well above old Cottonwood Island (approximately 15 miles north of Davis Dam, 35 40' north). This map, along with other supporting evidence, places the Mojave within the present Recreation Area. Kroeber (1953) claims that the Mojave once occupied Chemehuevi Valley to the south of Mohave Valley proper, which pushes their southern range well below "The Needles."

Restricting the occupation area to Mohave Valley would be too narrow a view

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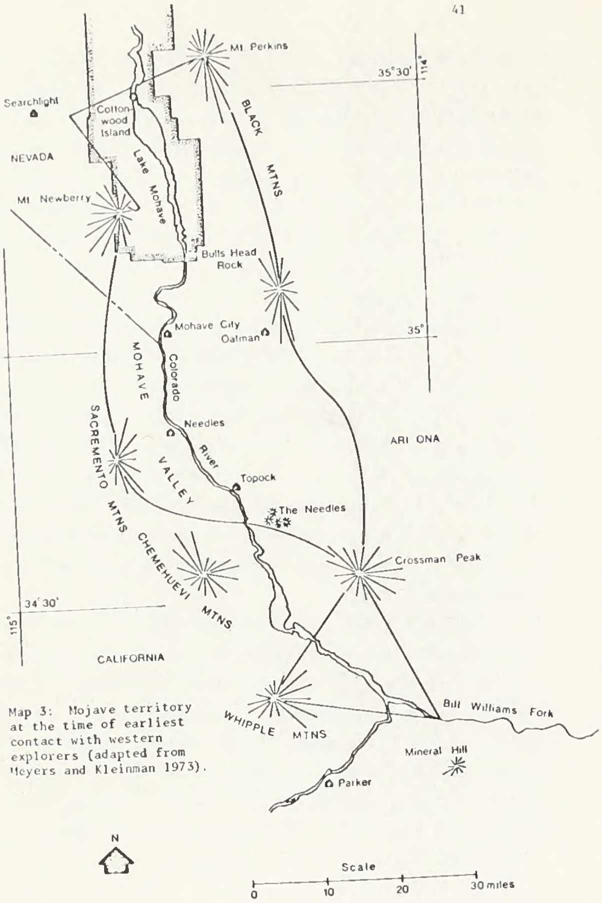
*This section is taken from David E. Ruppert's Lake Mead National
an Ethnographic Overview, March 1976, pp. 6-26; prepared for the
Service, Western Archaeological Center, Tucson, Arizona. This man
on file at the NPS Western Archaeological Center, Tucson, Arizona.



Map 3: Mojave territory at the time of earliest contact with western explorers (adapted from Meyers and Kleinman 1973).

in another respect. In lean years, or in times when the Colorado did not flood the valley floor, the Mojave followed an expanded food gathering subsistence pattern. The climate of the area is extremely dry (5 to 10 inches of precipitation per year). If the Colorado did not provide the moisture needed to germinate seeds and to sustain crops over the warm months the Mojave expanded their hunting and gathering range to include areas where grass seed and game were more abundant.

Expeditions of warfare and trade to neighboring groups also often took the Mojave beyond Mohave Valley and the Colorado River; when this is taken into consideration, the "core" area is seen to be surrounded by a large "buffer zone," within which the Mojave felt they had ultimate rights. Respect for this zone was maintained through alliances with some groups and through a constant state of warfare with others.

The Mojave apparently loved travel and pursued it for reasons of warfare, trade and pure pleasure. They did not see themselves as inexorably tied to the valley proper and knew of routes which extended far beyond their homeland. These trails reached as far north as the Shivwits Plateau (well into southern Great Basin territory); as far east as Supai and Hopi; southwest to Gila Bend and Phoenix; south to Yuma and the head of the Gulf of California; west to the Pacific Ocean at San Diego and Ventura, and northwest to Tehachapi and the Tula Lakes of San Joaquin (Kroeber 1953).

EARLY CONTACTS

Early explorers in the Southwest referred to the Mojave in a variety of ways, as each explorer heard something slightly different in response to his question about the name of the tribe. A partial list of tribal names attributed to the Mojave by early explorers includes: Amacave, Amajave, Jamajabs, Tamajabs, Ammachaves and Ammuchabos (Smith 1966). Coues (1900:226) gives a more complete

listing: Amaguagua, Amahuayas, Amochave, Amojaves, Amoxawi, Amuchabas, Hamockhavens, Hamoekhave, Hamokiavi, Jamalas, Machaves, Macjave, Mahaos, Hamukhava, Majabos, Majave, Mohave, Mohavi, Mohawa, Hohaw, Mohaoes, Mojaris, Mojaur, Molxares, Moyave, Soyopa, Tamasabes, Wah-muk-a-hah-ve, Yumagas and Yamajab (the list is included here for future research reference). Even the modern name (often written as "Mojave") is a misrepresentation of the name used by the Indians. "Mojave" is the spelling accepted officially by the tribal council, but the original name is "Aha macava," which means "people who live along the river" (aha - "water"; macave - "along or beside") (Sherer 1965:6, 71, Smith 1966). Coues (1900) and Hodge (1917), among others, mistakenly attribute the meaning of this term to the Mojave compound of "hamock" ("three") and "avi" ("mountain"); thus, the early interpretation that "Mojave" meant "three mountains" (referring to the Needles).

Regardless of the tribal names used by explorers, their accounts of early contacts with the tribe are informative. They give us an idea of the extent of Mojave territory just preceding the contact era and some information on how this territory expanded and contracted over time in response to changing relationships with their closest neighbors, to environmental stress and to the advance of white settlement.

1540 - Hernando de Alarcon: The earliest explorer to contact the Mojave may have been Alarcon, a member of Coronado's expedition of 1540. Alarcon, charged with the exploration of the Colorado River delta region, traveled some 200 miles up the river in a small boat before turning east in an effort to join Coronado's party. Smith (1966) claims that this would have put Alarcon in Mojave territory and in certain contact with members of the tribe. Coues (1900) also claims that Alarcon possibly came into contact with the Mojave and Schroeder (1954) traces Alarcon's route well into territory under Mojave influence. Although he made no explicit reference to the Mojave, Alarcon was told of Indians further upriver by his "Cumana" guides (Yavapai?; cf. Schroeder 1954).

There may be some question as to whether Alarcon actually came into contact with the Mojave, but given that communication often was swift among tribes along the Colorado and that the Mojave were possessed of a penchant for travel and adventure, it seems reasonable to assume that the Mojave were aware of Alarcon's expedition. The question then becomes one of the Mojave discovering Alarcon, rather than one of Alarcon discovering the Mojave (see also Hammond and Rey 1940).

1604 - Don Juan de Onate: The first reference to the Mojave comes from the Onate expedition of 1604-05. Onate set out westward from Sante Fe and marched toward the lower Colorado. There is some disagreement over his actual route (Kroeber 1953; Bolton 1950), but it seems that Onate came into contact with "Amacavas" just above the present site of Parker Dam. After his arrival on the Colorado at the mouth of Bill Williams Fork, Onate traded with the Mojave for foodstuffs (corn, beans and squashes). Leaving the mouth of Williams Fork, the expedition traveled down the Colorado approximately 15 miles (five leagues) to the present site of the Colorado Indian Reservation, where he found "Indians of the same tribe or nation" (Kroeber 1953:3).

Thus, Onate's visit clearly establishes the Mojave in the Mohave Valley over three and a half centuries ago. More importantly, it is clear from his accounts that the Mojave were engaging in horticultural practices in the valley before 1600.

1776 - Fray Francisco Garces: The next major contact with the Mojave was made by the indefatigable Fray Garces in 1776. Garces, while stati at San Xavier del Bac Mission near Tucson, ventured west on a num in order to baptize Indians, to record the geographic locations of various tribes and to establish a route of communication between the missions in New Mexico and California. It was on his fifth expedition that Garces came into close contact with the Mojave. His route on this trip took him along the Gila River to its mouth at the Colorado. Turning north, he came upon the Mojave along the Colorado River near the Mohave Range. After baptizing and preaching to a few "Jamajab," Garces was guided to the Mojave Trail (which leads through the Mohave Desert) by "el principal" of the Mojave group he was visiting (Coues 1900:228-29).

Garces' description of the Mojave encountered on this trip is informative (Coues 1900:230-32):

> The female sex is the most comely on the river; the male very healthy and robust. The women wear petticoats of the style and cut that the Yumas (wear). The men go entirely naked, and in a country so cold this is well worthy of compassion (the journal is dated February 29). These say that they are very strong; and so I found them to be, especially in enduring hunger and thirst. It is evident that this nation goes on increasing, for as I saw many young lusty fellow, and many more boys, the contrary is experienced in the other nations of the river. There came together to visit me about 20 hundred souls. Abound here certain blankets that they possess and weave furs of rabbits and otters (Coues notes here that these "otters" are probably beaver), brought from the west and northwest, with the people of which parts they keep firm friendship. They have been also intimate friends of the Yumas . . . the enemies that they have are, on the northeast the Yibipais Cuercomaches (an unkown group of Yavapai); on the east the Jaguallapais (Hualapai); and on the south the Jalchecones (the Halchidoma).

On a return trip to Mojave territory in July of the same year, Garces makes note of additional trade between the Mojave and tribes to the east (Coues 1900:414):

> There came with me . . . two Yahipais Jabesua (Havasupai) who brought mantas, leggings, and pieces of cowhide (pedazos de cuero de baca) to trade with the Jamajabs for shells - only for white sea-shells, for no others do they receive in exchange.

The description of trade relations points clearly to Mojave influence far beyond Mojave Valley. Trading extended north to the Paiutes (Chemehuevi?) for

rabbit and beaver furs. Blankets, leggings and cowhide came from the Yavapai to the east and probably from as far as Navajo country in the northeast corner of Arizona.

1851 - Captain Lorenzo Sitgreaves: Not long after the Southwest territories were brought under the control of the United States, the Army dispatched an expedition to explore the new area. Sitgreaves led a party across northeastern Arizona to the Colorado River to the present site of Fort Mohave (Schroeder 1954). After traveling many days through Hualapai territory from Flagstaff, Sitgreaves' party on November 5, 1851, descended the west side of the Black Mountains near the present town of Oatman. On his way to the river he met a party of Indians (one too heavily laden to escape; a trading party, perhaps), but he gives no indication as to the Indians' tribal affinity (Sitgreaves 1853:17). He apparently reached the river without encountering other Indians.

Two days later, after deciding not to follow the Colorado north to explore the mouth of the Virgin River, Sitgreaves followed "well-worn trails" down the river. It was along these trails that large numbers of Mojave gathered to meet his party:

> In the evening the camp was crowded with them (Mojave) bringing in for barter small quantities of pumpkins, beans, corn, and in one or two instances, of wheat, which seem to be the staples of their food, for no animals, except a few horses, were seen among them, and the few sheep we had left were the objects of great admiration, especially to the women (Sitgreaves 1853:18).

The beans, pumpkins, corn and wheat, which was introduced by the Spanish, were no doubt signs of a good crop during the preceding summer. At this time of the year these foodstuffs probably represented the Mojave's winter stores, which they relied on to get them through the dry, cold months of winter. Abundant crops during the summer were not always the case, however, as will be explained in greater detail later.

The party first was approached by three Mojave "mounted on fine horses" (Sitgreaves 1853:17). The Mojave kept only a few horses, for purposes of communicating news quickly between villages. Stationed at various places along the river, these horses were the prized possessions of the tribe and were exceptionally well cared for. They were kept in readiness to warn people in the valley in the event of an enemy attack, a call to war on the death of a relative. Non-Indian visitors often remarked on the sacredness of these horses (Fathauer 1954:101).

Sitgreaves (1853:18-19) gives further description of the Mojave themselves:

> The appearance of the Mojaves is striking, from their unusual stature, the men averaging at least six feet in height; and their stalwart and athletic figures offered a convincing proof of the excellence of a vegetable diet. Almost all the men were naked, with the exception of the breech-cloth. The hair, cut square across the brows in front, hung in loose braids behind, reaching frequently as low as the waist; occasionally it was matted on the top of the head into a compact mass with mud, for the purpose of destroying the vermin that infest them. The only garment worn by the women was a long fringe of strips of willow-bark wound around the waist, and falling as low as the knees. No covering to the feet was worn by either sex. Their arms are the bows and arrow, the spear and the club. The arrow is formed of two pieces - that to which the barb is attached, of hard wood seven inches long, or one-fourth the entire length; and the other of a light reed that grows profusely along the banks of the river, feathered, as usual, at the extremity. The custom still prevails among them of carrying a firebrand in the hand in cold weather, which is mentioned in the account of Coronado's expedition in 1540, and induced these discoverers to give the river the name Rio del Tizon. (Sitgreaves must be referring to Alarcon's journal. However, it is doubtful that Alarcon was attributing the firebrand to the Mojave; he probably noted its use among the Cocopa or the Yuma.) Their lodges are rectangular, formed of upright posts imbedded in the ground, and rudely thatched on the top and three sides; a portion of the interior altitude being sometimes obtained by excavation.

1853 - Lieutenant A. W. Whipple: In 1853 and 1854 the Army sent an exploration team to survey railway routes across the Southwest. Whipple led the group across northern Arizona, following Bill Williams Fork to the Colorado River.

Whipple provides some information of Mojave social organization. He noted

that there were five "chiefs" of the Mojave and that each chief was the leader of a group of warriors, varying in size from 50 to 100 members. "Lesser captains" were subordiante to these chiefs and commanded small handfuls of men (five in one case cited). Other men chose to remain at home to tend fields and were not of the warrior class (Whipple 1855:17).

Whipple estimated Mojave populations in 1853 at 4,000 including 600 warriors. There is no way to determine the accuracy of this figure. His descriptions of a few examples of Mojave dress, jewelry and weaponry, however, are fairly complete (pp. 33, 51-52). He also mentions the presence of Hopi blankets and a Zuni sash, which the Mojave claimed to have obtained from the Paiutes and the Yavapai (p. 43), giving some indication of trade with these groups. Other aspects of Mojave life are not described, but this probably was due to a lack of "a better means of communication with the people" (Whipple 1855:43).

1858 - Lieutenant Joseph C. Ives: Ives set out to scientifically explore the Colorado River area in 1857. His party, which included geologists, botanists, zoologists, topographers, meteorologists and artists, provided one of the first careful and complete descriptions of an area already traversed by a number of explorers. Ives himself proved to be a careful observer of the Indian groups he encountered. His route took him north along the Colorado River, from its mouth at the Gulf of California to Black Canyon. He then backtracked to Mohave Valley, where he turned east traveling along the southern plateau through Hopi and Navajo territory to Fort Defiance.

Ives provides some information on Mojave subsistence agriculture. From what Ives could determine, the Mojave hunted and fished little and relied almost exclusively on agricultural products, such as corn, wheat and b

> It is somewhat remarkable that these Indians should thrive so well upon the diet to which they are compelled to adhere. There is no game in the valley. The fish are scarce and of very inferior quality. They subsist almost exclusively upon beans and corn, with occasional watermelons and pumpkins, and are probably as fine a race, physically, as there is in existence. (Ives 1861:73)

The season during which Ives visited the Mojave is significant, in that it documents a reliance on these foods in February. It seems that during good harvest years--years when the Colorado overflowed its banks long enough to grow abundant crops--the store of agricultural products saw the Mojave through the winter. The Mojave did fish, but probably only after the river's floods subsided during the summer. The corn, wheat and beans doubtlessly were supplemented by stores of mesquite or screwbean meal gathered during the fall.

Interestingly, Ives makes special note of the importance of the seasonal flooding of the Colorado River. He goes so far as to suggest that when the river did not overflow, the result was a disastrous famine for the Mojave. Although he fails to make note of his sources, his information probably comes from Olive Oatman's account of the famine of 1853 (cf. Pettid 1968). He also suggests a direct relationship between the floods and the maximum population the valley could support:

> The annual overflow of the river enables them (Mojave) to raise, with little labor, an abundant supply of provisions for the year, which they improvidently consume, allowing the future to take care of itself. The failure of a crop is, therefore, an irremediable calamity. During one season, a few years since, the Colorado did not overflow its banks; there were consequently no crops, and great numbers of the Mojave perished from starvation. It is quite possible that such visitations are of periodical occurrence, and are among the means adopted by nature to prevent the population of the valley, as there is no outlet for its expansion, from increasing beyond the capacity of country to sustain it. This number is apt to be overrated. I have discovered that the crowds seen collected at the different points passed during our progress up the river have been composed, to a considerable extent, of the same set of individuals, and suspect that the chiefs in their formal visits have enhanced their apparent state and importance by borrowing recruits from their neighbors. (Ives 1861:73)

Summary: This short description of early contacts with the Mojave is not complete. Others contacted the Mojave, including the famous explorer Jedediah Smith in 1826 (cf. Morgan 1953) and Edward F. Beale, who in 1857 led a party of explorers (equipped with camels) through Mojave territory for the purpose of opening a road from Fort Defiance to the west coast (cf. Smith 1966; Schroeder 1954). Young Olive Oatman, a survivor of a Mojave-Apache (probably Yavapai) attack in 1851, lived among the Mojave as a captive for approximately five years. Her experience provides information which will be used in a later description of Mojave agriculture and warfare. The purpose here has been to provide a summary of those contacts which revealed most about Mojave aboriginal life. Even a limited understanding of the Mojave during the period of these early contacts is useful, as it helps place later ethnographies in a beter perspective.

SUBSISTENCE

Agriculture: According to Castetter and Bell (1951), the Mojave cultivated maize, teparies (both the white and yellow varieties), pumpkins (*Cucurbita moschata* and possibly a variety of *C. pepo*), gourds (*Lagenuria sicereria*), tobacco (*Nicotiana trigonophylla*), wheat and barley, muskmelons, cowpeas (*Vigna sinensis*) and sunflowers (*Helianthus annus*). The wheat, barley, melons and cowpeas were introduced by the Spanish. The Mojave also semicultivated seed plants, such as panic grass (*Panicum hirticaule*), crowfoot grass (*Dactiyloctenium aegyptium*), curlydock (*Rumex crispus*), barnyard grass (*Echinochloa crusgalli*) and an unidentified seed plant (Mojave name: *ankithi*).

Many of the early explorers' accounts refer to Mojave agriculture. Alarcon in 1540 found the major cultigens among the Yuma tribes of the Lower Colorado River to be pumpkins, maize, "a grain-like millet" and bottle gourds. Alarcon himself apparently brought such items as wheat "and other grains," beans and a few Spanish hens and cocks to trade (Castetter and Bell 1951:98-99). Thus, the

Mojave may have been introduced to wheat, and perhaps watermelon, as early as the 1540's. Wheat was a firmly established cultigen among the Halchidoma (a group south of the Mojave until 1828) when Garces visited that area of the Colorado in 1776. Although the Halchidoma were not on the friendliest terms with the Mojave, there is reason to assume that wheat had become equally well established in the Mohave Valley by this time. Olive Oatman's account of 1853 reports the cropping of "corn, melons and a few garden of vegetables" and suggests that wheat was established as a major crop upon which the Mojave relied heavily. By this time wheat shared the importance of corn and beans in the diet of the Mojave. Others, including Ives (1861) and Sitgreaves (1853), also report on the importance of agriculture among the Mojave.

The flood plains of Mohave Valley provided the arable land needed to cultivate these plants. The Mojave each year would wait for the Colorado to overflow its banks and to deposit its layer of fertile silt over the valley floor. When the water receded in July, seeds were planted in the soft mud with a simple planting stick. In this nutrient rich soil crops grew quickly and easily, without much field maintenance. The remaining summer rains were relied on for additional moisture as the river water receded farther from the fields.

There was no system of canal irrigation to bring water to fields in times of drought or when the river failed to overflow its banks, probably because canals could easily have been destroyed by the flooding from year to year. Fluctuations in the river's peak flooding also may have discouraged canal building, as such fluctuations would threaten damage or destruction of canals more than once during any given season. Individual family groups planted on higher ground in January and relied on pot-carried water until the river again flooded, leaving behind rich soil and ample moisture.

Castetter and Bell (1951:145) provide a yearly schedule for agricultural

and hunting and gathering activities for the tribes along the lower Colorado; this schedule does not specifically describe Mojave activity, but it provides a general pattern, which the Mojave probably followed:

1. First Month - "budding of cottonwood;" equates with late February to early March; a month of relative inactivity because of climatic conditions.
2. Second Month - "month in which willow and mesquite bud; also the windy month;" March; clear new land suitable for planting; greatest dependence on hunting; fishing unimportant.
3. Third Month - "planting of spring;" most of April; if conditions were suitable, some planting was done; otherwise, hunting and fishing were emphasized (this means that when very early flooding of the river occurred, an early planting sometimes was made); clearing of old lands in preparation for main planting.
4. Fourth Month - "month of wild berries; month when wheat ripens;" latter part of April and early May; taking of river fish.
5. Fifth Month - "month when river reaches its highest peak; breaking-of-the-gourd month;" a somewhat variable period, usually coming in late May and June; before waters receded, standed fish were taken or those in shallow water were shot; period of scarce food supply; planting was done toward end of period.
6. Six Month - "mesquite beans ripe;" late June and early July; women gathered mesquite pods and pigweed greens; men finished planting.
7. Seventh Month - "hoeing time;" equates with late July and much of August; screwbeans ripe; river fish taken.
8. Eighth Month - "green corn ripe;" most of September; river fish taken.
9. Ninth Month - "harvest month;" late October and early November; busy with gathering crop; lots of dancing and celebrating; rabbits and birds taken.
10. Tenth Month - "frost months;" most of November; building of winter home, which was very important.
11. Eleventh Month - "middle of winter;" December; a period of inactivity although rabbits and birds were hunted.
12. Twelfth Month - "dried cane month;" January and early February; a continued period of inactivity; rabbits and birds hunted supply scarce.

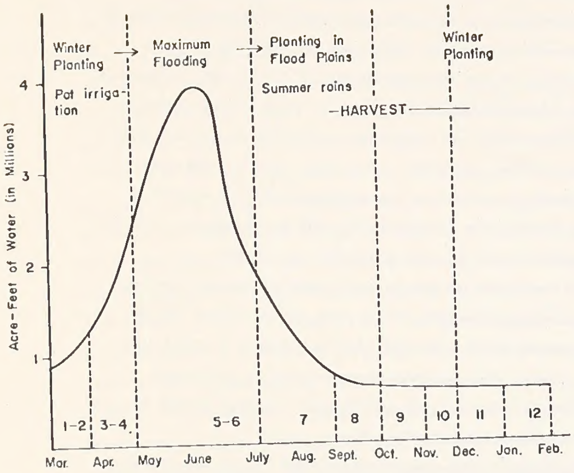


Figure 2: Mojave farming practices correlated with average Colorado River flow (flow records from Castetter and Bell 1951).

Figure 2 correlates these activities with the flooding patterns on the river.

The importance of the flooding of the Colorado cannot be overestimated. The Mojave relied on agricultural products for an estimated 50% of their subsistence (Castetter and Bell 1951:74). If the flood plains were not inundated with water, planting was difficult or impossible; because the surrounding area receives so little annual rainfall (5-10 in.), post-flood water was essential to crop maturation. The importance of flooding is underscored by the celebrations which took place when it occurred. Oatman (1935:124) writes that ". . . it was a season of great rejoicing when the Colorado overflowed, as it was only after overflows that they could rely upon their soil for a crop."

The Mojave relied on agriculture far more than did other tribal groups along the lower Colorado (Cocopa - 30%, Yuma - 40%) (Driver 1957). The combined physical features of Mohave Valley, along with silting and flooding patterns, may account for this. The valley configuration provided extended flooding (1 to 2 miles wide) when the river overflowed. The silt left behind by the floods was essential to Mojave agriculture in a desert environment. Noy-Meir notes (1974:205) that in ". . . most arid soils a large proportion of nutrients in both organic and mineral forms is concentrated in the surface layer (0-5 cm), while the rest of the profile is rather nutrient poor. This is because both decomposition and leaching rates are low. The consequences are that a large part of the nutrient pool is susceptible to loss by erosion and (for nitrogen) volitilization." Thus, these nutrients are the first to wash away in heavy rains and runoff. The Colorado River silt carried these soil nutrients and deposited them in the river's flood plains. Mohave Valley's wide flood plains allowed long shallow flooding and deep renewed silting from year to year, encouraging unusually rapid crop growth and good yields with

with minimum maintenance. Mojave dependence on agriculture, therefore, was fostered by the environment in which they lived.

Land was owned privately or was claimed by specific groups living on or near the land. Landmarks designating family garden plots or a group's larger agricultural tract often were wiped out by annual flooding, however, resulting in quarrels over land ownership. A ritual tug-of-war between opposing individuals or groups provided a solution. Kroeber (1925:744-45) describes the contest:

> . . . One man was surrounded by his friends, who tried to shove or drag him across the disputed territory, whereas their oppoents struggled to carry a champion of theirs to the farthest end of the land of the aggressors. In this scuffle legs were sometimes broken and the human footballs nearly crushed and pulled to death. The stake of the contest may sometimes have been not only the stretch first in dispute but the entire arable holdings of both contestants.
>
> If the losers were dissatisfied, they reappeared next morning at their asserted boundary, armed with willow poles a couple of inches thick and 5 or 6 feet long. Each man held a shorter stick in his left hand. The victors met them, and a stick fight, chetmana'ak, ensued, which might last for hours. The contestants beat each other, but no one was killed, say the Mohave, but men sometimes died afterwards, especially when they fought long on a summer's day and maggots bred in the wounds. The object of each party was to drive the other back across the disputed tract, whereupon title to it was definitely established.

Wild Resources: The Mojave relied upon a wide variety of wild plants to supplement their agricultural produce. Fishing was important just after the floods along the river receded, leaving sloughs with trapped fish. The hunting of small game, such as birds and rabbits, took place throughout the year, while larger game, such as deer and bighorn sheep, occupied the men during the winter (Smith 1966; Steward 1947, 1957; Castetter and Bell 1951).

Wild Plants: The mesquite bean was the most important wild food gathered by the Mojave. Two varieties of mesquite were gathered: screwbean (Prosopis pubescens) and the honey-bean mesquite (P. juliflora). Mesquite beans were harvested in late June, the screwbean in August. Women did most of the gathering of mesquite and other plants, sometimes ranging far from camp or village after the mesquite nearby was harvested. Trees normally belonged to the owner of the land on which they were found and permission from the owner was required to gather mesquite on another man's land (Smith 1966; Castetter and Bell 1951).

Mesquite meal was made by drying the bean on housetops before crushing it into a flour with wooden or stone mortars. The meal sometimes was eaten raw (Kroeber 1925). Cakes were made by adding water to the meal and baking the dough on hot stones. These sometimes were stored for later use or were taken on long journeys as a ready food supply. Raw beans were stored in rooftop arrowweed willow baskets or on short platforms. Fresh screwbeans sometimes were cured in large pits, 15 ft. across and 4 or 5 ft. deep, lined with arrowweed; water was sprinkled on the beans, which turned brown and sweet and were ready to eat in about a month (Kroeber 1925). A mildly intoxicating drink was made from the honey bean and the screwbean by steeping the crushed pods in water (Castetter and Bell 1951).

After the mesquite bean, wild seed plants proved the most useful to the Mojave. A list of seed plants utilized by the Mojave, a modification of Castetter and Bell's (1951) list for the entire lower Colorado River region, appears below:

1. Quail brush or lenscale (Atriplex lentiformis)
2. Desert Saltbush (A. polycarpa)
3. Careless weed, bledo, redroot, pigweed, love-lies-bleeding, quelite (Amaranthus palmeri, A. caudatus)
4. Barnyard grass (Echinochloa crusgalli)
5. Panic grass (Panicum hirticaule)
6. Tansy mustard (Descurainia obtusa)
7. Sprangle-top (Leptochloa viscida)
8. Iodine bush (Allenrolfea occidentalis)
9. Flat-edge, chufs, yellow nut grass (Cyperus ferax)
10. Ammannia (Ammania coccinea)
11. Evening primrose (Oenothera brevipes)
12. Sage, chia (Salvia columbariae)
13. Ironwood (Olneya tesota)
14. Yellow paloverde, Blue paloverde (Cercidium microphyllum, C. floridum)

15. Sunflower (*Helianthus anuus*)
16. Acorns (*Quercus turbinella*)
17. Aurlydock (*Rumex crispus*)
18. Seven unidentified plants are listed. The Mojave names are: *Koskwaka*, *Samkoatkh*, *Xam ats pats*, *kwats kul ka*, *Apan*, *Ex ham Sekel*.

The seeds were prepared in various ways; some were dried into flour, some were boiled and some were eaten raw. Beverages were made by steeping the seeds in water.

The Mojave also gathered roots and tubers. Cattail (*Typha latifolia*, *T. augustifolia*) was sought for its roots and pollen. The tubers of the arrowweed plant (*Sagittaria simplex*) reportedly were used by the Mojave as early as 1878. The desert lily (*Hesperocallis undulata*) occurs in the area and probably was eaten by the Mojave, as it was gathered by tribes farther south along the Colorado. The hog potato (*Hoffmanseggia densiflora*) and an unidentified plant known to the Mojave as *slalyk* also were eaten.

Some plants were used as greens and the fruit of others was gathered at certain times of the year. A list of these plants appears below:

Greens	*Fruit*
1. Careless weed (*Amaranthus palmeri*)	1. Wolfberry (*Lucium fremontii*, *L. exsertum*, *L. andersonii*)
2. Sow thistle (*Sonchus asper*)	2. Lotebush (*Condalia lycioides*)
3. Spiny aster (*Aster spinosus*)	3. Cholla (*Opuntia echinocarpa*)
4. Thelpodium (*Baccharis glutinosa*)	4. Pricklypear (*Opuntia engelmannii*)
5. Goosefoot (*Chenopodium fremontii*, *C. murale*)	5. Mohave yucca (*Yucca schidigera*)
6. Dudley or Goodding willow (*Salix gooddingii*)	6. Ground cherry (*Physalis fendleri*)
7. Curlydock (*Rumex crispus*)	7. Kukik (Mojave name - specific plant type unknown)

Game: Small game was hunted throughout the year; larger game was hunted during the winter. Stewart (1947) reports that hunting parties consisted of from 10 to 12 men. These parties normally had no officially sanctioned hunt leader. The Mojave hunted with bow and arrow or with a throwing stick. The bow and arrow were used for larger game, such as mountain sheep (*Ovis canadensis*)

and the black-tailed deer (*Odocoileus hemionus*); the curved throwing stick was used to kill the three varieties of rabbit in the area (*Lepus californicus eremicus* and *L. californicus deserticola*, *L. alleni alleni*, *Sylvilagus auduboni arizonae*). The black-tailed jackrabbit (*L. californicus*) was considered poisonous. Rabbit drives, in which the animals were chased into nets made of vegetable fiber, were practiced and rabbit traps also were used.

Deer were hunted between the months of July and October and, occasionally, in the spring. Only certain men hunted deer. The dream life was important to the Mojave and only those who dreamed of hunting early in life were given the title of sharpshooter and allowed to hunt deer. Deer meat and hide often were obtained from Hualapai hunters, who accepted agricultural products in return. A deer brought in by a Mojave hunter could not be eaten by the hunter; he received vegetable goods from others in return for the meat.

The Mojave also hunted and ate the ground squirrel, chipmunk, raccoon, badger, gopher, muskrat, chuckwalla, beaver, rat, fox and coyote. Fox and coyotes were taken in baited dead falls. Rats were trapped in snares with pumpkin seeds as bait. Fish nets were thrown over dams to catch beaver. Wildcat, mountain lion, bobcat, skunk and porcupine also were trapped, but were not eaten, as they were valued for their hides.

Quail were trapped in nets, snares and box traps. Quail eggs also were eaten. Ducks and mudhens were hunted and eaten, while eagles, buzzards, crows, pelicans, cranes, blackbirds, roadrunners, hawks and owls were hunted for their feathers and were not eaten (Stewart 1947).

Castetter and Bell (1951) note that hunting was a relatively unimportant activity for the Mojave and that the lack of ritual activity related to hunting reflects its lack of importance in Mojave subsistence. There is other evidence that hunting occupied the Mojave less than it did other Yuman groups on the lower

Colorado, but to rely on the lack of ritual activity as an indicator of this is risky. For example, there seems to have been little ritual connected with agricultural practices, yet agricultural products may have constituted more than half of the Mojave's yearly subsistence.

Fish: Fish were plentiful in the Colorado during the flood season and those trapped in sloughs as the water began to recede were easily caught with limited equipment. As in hunting, success in the dream life was necessary for successful fishing. Stewart (1957:199) notes that "the expert fishers were men who had dreamed properly, upon whom the culture hero *Mastamho* had conferred in dreams the power for success in piscatorial activities. One of my informants said, 'When the man that dreams catches hold of a fish, the fish won't move.'" The power to catch fish, however, could be given to others who had dreams and fishing was pursued actively by anyone who wished to try his luck.

Fish caught and eaten included humpbacked sucker (*Xyrauchen texanus*, a fish approximately 18 to 24 inches long), bony tail (*Gila elegans*), mullet (*Mugil cephalus*) and bull salmon (*Ptychocheilus lucius*, a three-foot minnow).

Stewart (1957) lists a number of techniques used by the Mojave to catch fish. These include:

1. *Ihuly*: A seine or drag net, approximately 25 feet long and 8 feet high, was made of tough cowpea fibers and weighted with stones attached to arrowweed sticks placed vertically through it. Poles were attached to each end of the net and two men dragged it through the water.

2. *Suak*: A net six feet in length and four feet deep, the *suak* was attached to two poles and dipped into the water by one man. Another man beat the water with sticks, driving the fish toward the net. The net man brought the sticks together, thus trapping fish in the closed net.

3. *Acisayul*: A small suak used in shallow water, this device required no beater. The net man merely watched for fish swimming near the net.

4. *Kwithata*: The *kwithata* was a fish scoop, 5 feet long and 18 inches wide, made of willow. A handle attached to the willow allowed one man to manage the scoop. It was used only in sloughs and lagoons.

5. *Acuckpe*: This brush "fence" or weir, 10 to 15 feet in length, was constructed of willow twigs and poles set in the mud. One man with a dip net (suak) stationed himself in the weir and scooped out the fish when they became trapped.

6. *Acinuya*: A semi-circular weir baited with pumpkin seeds, this trap was constructed much like the acucukpe, but the procedure for catching the fish differed. The fisherman, after baiting the weir, would leave for several hours. If the willow sticks set in the mud were moving when he returned, he merely scooped up the fish with a suak.

7. *Hook and line*: A Mojave occasionally used a barrel cactus spine (heated and bent into shape) for a hook, in conjunction with a willow pole and cowpea fiber line. Bait included worms, grasshoppers and small fish. Stewart (1957:201) doubts that this method was used commonly by the Mojave, as fish could more easily be caough with traps and scoops.

8. *Bow and arrow*: The bow and arrow rarely were used to fish and then only by old men in sloughs and lagoons.

Fish was prepared and cooked by men, as was meat. Women were responsible for cooking agricultural products and wild seeds. Fish was eaten fresh and normally was prepared by broiling on hot coals or by boiling in a stew to which cornmeal was added.

RELATIONS WITH NEIGHBORING GROUPS

Warfare: Discussion of warfare is prominent in the Mojave literature. The Mojave warred on neighboring groups with frequency and were regarded by early white settlers as extremely hostile. A system of alliances made the Mojave permanent friends with the Yuma, Havasupai, Hualapai and Yavapai. Among the bitter enemies of the Mojave were the Maricopa, who lived along the Gila River; the Halchidoma, who were expelled by the Mojave from their territory on the Colorado River south of the Needles, and the Cocopah. There are r

fighting with the Chemehuevi, a Southern Paiute group which for a t

Chemehuevi Valley and, later, Cottonwood Island (now submerged under Lake Mohave) north of Mohave Valley; the Southern Paiute, probably the Las Vegas and/or Moapa Paiute; the Diegueno to the southwest in California, and the Pima, the Gila River irrigation farmers to the southeast.

As in all other aspects of Mojave life, dreams played an important role in warfare. Potential warriors dreamed of hawks, the morning star, dust storms or of fighting large animals. Young men who claimed to have dreamed properly were quizzed about their dreams by elder warriors. If the young men correctly recounted their dreams, they were said to have "dream power" and became good prospects as "braves". Members of other Mojave institutions also received their "powers" from dreams. Shamanistic powers, for example, were conferred on those who had "dreamed properly." Women who danced at festive occasions and who supported men in war parties through performances of certain dances also received their power from dreams. In short, dreaming provided one's credentials for membership in all important Mojave institutions. Fathauer (1954) claims that dreaming is the very foundation of Mojave social life and that proper dreaming provides a selection for or against individuals with specific personality traits. Young men who "acted mean" or were aggressive in their dealings with others became members of the warrior class. Dreaming, then, can be seen as a means of ritually institutionalizing and reinforcing certain kinds of social behavior. In the case of warriors, dreaming reinforced and sanctioned belligerence, aggressiveness and bravery in fighting.

Mojave fighting methods stressed close-in hand-to-hand combat. Bows and arrows were used, but bowmen were not "proper dreamers" and did not belong to the warrior class (Fathauer 1954). The object in battle was to draw the enemy close so that a mallet-headed war club, the halyahwai, or the tokyeta, a straight club of mesquite wood (Kroeber 1925:751), could be used to smash his skull. When an opponent fell, his head sometimes was removed so that scalpers could claim their prize at their leisure after the battle. Scalpers belonged to their own class and, like warriors, received their power from dreams. Stewart (1947) notes that a few women sometimes accompanied men in war parties. They did little fighting, however, except in self-defense. Their primary function was to help increase morale among the young warriors.

War parties of 50 to 60 men commonly were formed and raids were planned well in advance. These expeditions were carried out against traditional enemies, but a few skirmishes engages Hualapai allies to the east and the usually friendly Chemehuevi, who settled along the Colorado south of Mohave Valley. Oatman (1935:156-157), who for a time was a captive of the Mojave, describes the extensive and well-laid plans for a raid on the Cocoph near the Colorado delta. Large expeditions also were planned. The Mojave mustered their own warriors with those of neighboring allies, such as the Yavapai and the Yuma, to war against the Maricopa, their traditional enemy. Kroeber (1925:753) recounts the last great war expeditions against the Maricopa in 1857 or 1858. His narrative not only illustrates the size of such a war party, but also gives a nortion of the extent of Mojave alliances and the general Yuman style of fighting:

> . . . The Mohave, in a party whose numbers are not exactly known but estimated by themselves as about 200, were joined at Avi-kwa-hasala by 82 Yuma and a considerable body of Yavapai and a contingent from a more remote tribe whom the Mohave call Yavapaya-hwacha, "traveling" or "nomadic Yavapai" and the description of whose appearance and manners exactly fits the Apache. The Maricopa summoned the Hatpa or Pima, "a large tribe of many villages," as the Mohave found to their cost. The battle took place at Avi-vava, in an open plain. The Apache fought fiercely for a time but fled when things turned against them, and escaped without a fatality. The Yavapai followed but lost seven. The majority of warriors of these tribes were probably mounted, whereas the river nations fought on foot. A part of the Mohave and all the Yuma were surrounded and exterminated after a most determined hand-to-hand fight. Sixty Mohave fell and 80 to 82 Yuma - Mumara-va'acha and Kwasanya being the only survivors of the latter. The Yuma refused to flee and stood in a dense mass. When the foe charged, they attempted to grasp and drag him into their body where he was hacked to pieces with great knives.

Theories attempting to explain Mojave warfare are found throughout the literature. A few authors suggest an economic motivation for fighting. Kroeber (1925), for instance, draws attention to the taking of women and children after a victorious battle. These captives became a source of domestic labor in Mojave villages or were sold as slaves to other groups. In general discussion of changes in Yuman warfare, Dobyns and co-authors (1957) espouse the hypothesis that raiding for slaves was important. They also suggest that raiding for horses became a major motive for war after Spanish and American contact. These authors also claim that Stewart (1947) provides evidence that the Mojave raided Maricopa camps for agricultural products, recounting an episode in which the Mojave "killed a few people, and ran away with corn, watermelons. . .," as well as horses (Dobyns et al 1957:49).

Fathauer (1954:110) provides a different view. Warfare for the Mojave, he claims, "was largely non-instrumental: it was an end in itself." Mojave warfare was stimulated by tribal mythology and functioned to reinforce elements of prestige and bravery. Fathauer nods to the economic theories by stating that there may have been a need earlier in Mojave occupation along the Colorado to defend the fertile Mohave Valley from the intrusions of neighboring groups. Outside of this, he rejects economic explanations and relies on psychological and sociological factors.

Kroeber (1925) tacitly supports this view by suggesting that the Mojave fought for pleasure and for sport. Non-economic explanations also are advanced by Forde (1931) for warfare among the Yuma, frequent allies of the Mojave. Forde writes that "fighting was not justified merely as a virile pursuit, nor was economic need adduced as a factor: warfare to the Yuma possessed a strong mystical value as the means whereby the spiritual power of the entire tribe was enhanced and at the same time demonstrated" (in Kroeber and Kroeber 1973:2). Although Dobyns and co-authors (1957) suggest that Stewart (1947) gives evidence for economic motivations for Mojave warfare, Stewart himself (1947:431) relies on the non-economic psychological explanation. He describes the Mojave as constant aggressors, uninterested in plunder, and claims that territorial aggrandizement was not a motivating factor.

Both the economic and the psychological explanations have their appeal. There can be little doubt that the Mojave organized war parties with specific reasons in mind, such as the enhancement of personal prestige among young warriors. At times, though perhaps infrequently, they stole foodstuffs and took captives for labor and to sell as slaves. Mojave warfare was incontestably a major sociological fact of life, in that it was institutionalized in a warrior class (kwunamis), which derived its authority through the "proper dreaming" of its members. So serious examiner of the historical record can dispute the conclusion that warfare among the Mojave was a complex blend of psychological, sociological and economic factors, much as it is in our own society.

This report by Rupert is a brief summary of the ethnological information on the peoples who occupied the subject area at the time of contact. He has also included historical information derived from the first Europeans who entered this section of the Colorado River, who encountered these groups and recorded their impressions. At the time that Fort Mojave was built in the late 1850's the Mojave Indians still occupied this area.

HISTORICAL SUMMARY

Dennis Casebier, who has researched the Mojave or Government Road extensively and published on his data, was requested by ARC to serve as a consultant on this project. On December 16, 1977, he accompanied ARC personnel and S. Rolf, Las Vegas District Office of the BLM, to the study area, and located the areas that he thought were pertinent to a consideration of the Old Government Road, and its historic significance.

> One question being raised was whether or not the historic Mojave Road (frequently called Old Government Road today but hereafter referred to as Mojave Road or Trail) exists on the BLM lands in Clark County, Nevada, adjacent to the Fort Mojave Indian Reservation, presently being considered for transfer to the State of Nevada. The answer is yes... there is no question but that the Mojave Road had to cross the lands under consideration to reach the Fort Mojave ferry crossing. There are at least two alignments of the old route through the area that are visible today.
>
> The alignments which are of interest to the subject lands, are on the east side of the Dead Mountains and east of the pass between the Dead and Newberry Mountains. They represent the various approaches that were worked out by explorers and travelers over a hundred years ago to negotiate the ten or twelve miles between the Dead Mountains and the crossing of the Colorado River...The route consider(ed) to be the oldest entered the valley of the Colorado from the west by turning the north end of the Dead Mountains and heading southeast along the northeastern corner of those mountains until the large east-west trending wash was encountered in Sec. 23 T33S R65E at which point the route turned more nearly east away from the Dead Mountains and followed this broad wash down into the Colorado River bottom and on to the point where the Fort Mojave ferry crossed the river. This is directly across from the site of old Fort Mojave (which is in Arizona). This route is traveled some today and apparently has been at least lightly used by vehicle traffic for many years...
>
> The second alignment...is a slightly later route in point of time. When Hardyville was established on the Colorado River in 1864 (on the Arizona side about two miles below the present Bullhead City) the route of the Mojave Road after leaving the pass through the Dead and Newberry Mountains was changed to accommodate this important new community. In fact, William H. Hardy built a new road that would go directly to the Hardyville ferry. This new road left the pass more directly east toward the river and then once the river was reached it followed along close to the bank to the point opposite Hardyville. This road was maintained by the commercial interests in Hardyville and therefore it tended to be in better condition than the earlier roads. It was natural for the people of Fort Mojave to make use of this improved

> road by developing a straight connecting road between the new Hardyville cutoff and the Fort Mojave ferry. The intersection for this connecting road begins in Sec. 1 of T33S R65E (very near BM 1406) and runs pretty directly SE toward the Mojave ferry site.
>
> It is likely that a number of variations to the allignments...existed over the years. The terrain between the Dead and Newberry Mountains pass and the Colorado River is not particularly rough giving teamsters and other travelers some latitude in the choice of specific route. A bad washout on one route could cause the exact course followed to be changed slightly. Or, when a particular route became rough, the teamsters would "move over a ways" or maybe even "go down another ridge or draw." Evidence of this kind of meandering is seen at other places where the terrain would permit along the Mojave Road. In fact, it is a common characteristic of other early wagon roads in the West where the country adjacent to the road was unsettled.
>
> A second question being raised...was to evaluate the historical importance of this area. To my mind the general area of the Fort Mojave Crossing of the Colorado River is one of the most important and significant historical localities in all of southern Nevada. This was the second place on the treacherous "Rio Colorado of the West" where a ferry was established to carry the white man and his trains over the river (Yuma was first). It is the very heart of the country occupied by the great Mohave Nation in recent prehistoric and early historic times. They lived right there in the valley, both in and out of the area under study....the sites are there, they are simply covered by river deposits. Once excavation and development is commenced on this site it will be discovered that a great nation of aboriginal Americans lived here. But then it will be too late to save the remains...
>
> Continuing with a discussion of the historical importance of the area. The existence of the great Mohave Nation here---with their frequent surplus of supplies resulting from their agricultural use of the Colorado Valley---attracted virtually all the early white travelers who passed through this part of the United States. In 1976 the Spanish Padre Fr. Francisco Garces was here. Of the greatest importance to America is the fact that the first American to reach California overland---Jedediah Strong Smith---made his trek by way of the Mohave Villages (in 1826) and what later became the Fort Mojave crossing of the Colorado. He then transited the California desert by way of the Mohave Indian Trail. The massacre of half of Smith's party by the Mohaves in 1827 took place in this vicinity when he was here on his second trip to California. In the years after Smith's passing other American mountain men and adventurers used this trail to reach Mexican California---Kit Carson, William Wolfskill, and many other famous men used the route. To them the Mohave Villages (part of which were on the subject lands) and this comparative safe crossing of the Rio Colorado was a widely known and significant location in the early American West.
>
> Behind the trappers came formal American exploring expeditions. They are too numerous and complicated to be enumerated here. I will mention, however, as a reminder of one of the elements of uniqueness of this trail and the river crossing, that in the years 1857-1861 the well known

> camel experiment was conducted by the War Department in New Mexico, Arizona, and California and the future Fort Mojave crossing is where they crossed the Colorado River. Not just once but many times.
>
> ...A battle critical to Mohave/white relations took place in the subject lands in March of 1859. Samuel A. Bishop (the man for whom Bishop, California is named) with a small party of frontiersmen had a pitched battle with literally hundreds of Mohaves at the north end of Beaver Lake. This site is located in the lands under consideration (probably in the SE corner of Sec. 17 T33S R66E or Sw corner of Sec. 16 same township and range).
>
> In 1859 the Mohave Indian Trail became an established wagon road and shortly after that a ferry was started at Fort Mojave and maintained there for many years. The impetus for this was, of course, establishment of Fort Mojave just across the river in that year. The fort was maintained there until 1890 (with a two-year interruption during the Civil War), at which time it became an Indian school. The existence of this ferry (the only one above Yuma when it was established) made this crossing a focal point for wagon travel throughout this part of the United States.
>
> In 1863 Arizona Territory was created by Congress. The next year the capital of the new territory was established in the mountains of central Arizona and named Prescott. A 160-mile road was laid out between Fort Mojave and Prescott and immediately the Mojave Road became one of the principal lifelines to the struggling new territory. In the years that followed thousands of wagons, an uncounted number of soldiers, great herds of cattle and sheep, civilians of all classes, government officials, and the United States mails, rolled back and forth between California and Arizona. The Mojave Road and the Fort Mojave and Hardyville crossings of the Colorado became objects of importance on the maps of the United States. (Casebier, 1977:1-4).

The complete data on the Mojave Trail, its subsequent history, and related information is discussed in a series of books by Dennis G. Casebier: Carleon's Pah-Ute Campaign, the Battle at Camp Cady, Camp Rock Spring California, Fort Pah-Ute California, The Mojave Road, and The Mojave Road in Newspapers. In the addendum to this report is a historical background for the Mojave Trail, prepared by Phillip I. Earl, Nevada Historical Society, Reno, Nevada.

Several records exist concerning Indian occupation of the project area in relatively recent times. In 1932, Swanholm, a surveyor doing realignments for a township, recorded as two survey points buildings which he designated as "old Indian cabins". He does not state how he knew that they were Indian

cabins. He does say in his general description "there are no settlers within the township. Adjacent to the lowlands in section 16, a small area has been cleared and cultivated in past years and is now being used as an experimental date farm. It is the only occupied land lying outside the Mojave Indian Reservation which embraces most of the lowland area along the river. Most of the arable land is found within the bottom lands, which are subject to overflow during the periodic flood stages of the river, and for that reason, have not been extensively cultivated" (Swanholm, 1932:35).

There is a 1940 report on the so-called Fort Mojave tract, on the Nevada side of the Colorado River, apparently conducted for the Bureau of Reclamation on the soils, water and climatic conditions. In this report there is a reference stating that: "Mike Tobin, a Chemehuevi Indian, who moved off the reservation some 30 years ago following a disagreement with the Indian Service Officials, filed an application for 160 acres in Sections 16 and 17, T. 33S., R. 66E., Mount Diablo Meridian, but his entry has not been allowed. Although he has continued living on this land, he has done nothing to develop the land other than to periodically burn the arrowweed and mesquite"(Anonymous, 1940:15). The Indian cabin shown in Swanholm's 1932 map borders on Sections 16 and 17 and it appears that this is the Mike Tobin cabin referred to in the 1940 report.

It is interesting that his possible Tobin cabin is adjacent to the presently privately owned land in the Fort Mojave region, where the historic cemetery is located. During the second phase of the inventory a local informatant told ARC staff that he had heard that an Indian or two had also been buried in the cemetery as well as a non-Indian couple. When the cemetery was checked during the first phase of the inventory, two still existed which are illegible. There are indications that there are more burials, within the cemetery area, although markers no longer exist.

A resurvey by Sibley in 1961 of the lands within T. 33S, R. 66E. on the west side of the Colorado River, recorded that: "There is one old Indian settler in sec. 9, near the ¼ sec. cor. of secs. 8 and 9" (Sibley, 1961:15). There is no indication if this was Mike Tobin or another Indian settler. This is not the locale previously recorded for Tobin in the 1940 report. It could be the other Indian cabin to which Swanholm referred in 1932 and located on his map at the western line of Section 9. This is no way of confirming this assumption on the basis of land claims, as in all probability no official records have been filed.

In phase one of the inventory of the Fort Mojave region, a number of historic sites were recorded and photographed on the second terrace. Some of these are relatively late in time, post World War II, and others appear much earlier. Some of the material observed in the historic debris associated with NAS site numbers 26OK1402, 1403, 1404, 1411, and 1421, included data that appear to date before the turn of the century based on the presence of hole-in-top cans. This type of can was manufactured only until 1900 A.D. Other possible indications of earlier historic use are the fragmentary bottle necks without seams and pieces of purple stained glass.

Dennis Casebier provided a copy of a map of the military reservation at Camp Mojave, Arizona, made by George Wheeler in 1869. This map included areas on the west side of the Colorado River in the flood plain and several locales are shown that are labeled "rancherias". This term was used to refer to small Indian encampments and probably represents Mojave Indian settlements located in the flood plains in the vicinity of Fort Mojave.

ENVIRONMENTAL BACKGROUND

> Physical Factors. The lands under consideration in the Fort Mohave area are located in the Sonora Desert section of the Basin and Range physiographic province within the Colorado River Valley. This area is generally bounded on the north by the Newberry Mountains, on the west and southwest by the foothills of the Dead Mountains, on the south by the flood plain of the Fort Mojave Indian Reservation, and on the east by the channel of the Colorado River, which has been controlled and stabalized by the Bureau of Reclamation with a series of dikes and levees. The eastern third of the area is located on the remnant of the Colorado River flood plain that existed prior to the channelization of the river. This area is generally flat with sandy soils supporting dense, phreatophytic vegetation. West of the flood plain, the terrain rises on the alluvial fans of the Newberry and Dead Mountains. This alluvium supports a sparse, desert shrub vegetation (BLM Environmental Statement, 1975:23).

The climate of this project area is described as "typical of the southern Great Basin arid environment. The four seasons are well defined. The summers are hot with daily temperatures commonly reaching above 100°F. The daily summer minimums, especially in the valleys range between the high 60's and low 70's. This nightly drop is created by cooler mountain air draining downward from the higher elevation, and active night radiation cooling. Winters are mild and short with average temperatures falling in the low 70's. Occasionally winter temperatures fall below freezing. Summer precipitation generally occurs as a result of storm movement originating in the Gulf of California of the Gulf of Mexico. "The summer months bring violent thunder storms which form quickly and deliver their rain in sudden showers, causing occasional floode and much erosion" (Longwell et al., 1965:58).

> Approximately 50 percent of the annual precipitation occurs during the winter months, December through February. During the five months, May through September, 25 percent of the annual precipitation is received. Most of this comes during July and August from a few short-duration, high intensity convective storms (BLM Environmental Statement, 1975:23).

During the time period of the archaeological survey it was noted that the air could be quite still in the project area with a high level of humidity created by convective storms in adjacent mountain regions. The nightly drop in temperature expectable in other parts of the southern Great Basin, did not occur in the arroyos or river flood plain area, although on the upper alluvial fan slopes there was a nightly cooling accompanied by slight breezes.

> The vegetation on the flood plain is typical of river bottom areas along many southwestern rivers and consists mainly of arrowweed, salt cedar, mesquite, willow, with occasional cottonwood, smoke tree, cattail, saltbrush, acacia and pigmy cedar. A few annual grasses grow in the area; these are usually found where the overstory has been burned or where the water table is near the surface (BLM Environmental Statement, 1975:24).

The vegetation of the study area is a floristic blend of both the Mojave and Sonoran desert plants. Many of the flora encountered are found commonly in both regions, but occasional Sonoran plants have crossed the Colorado River and established viable populations. Of especial interest are the ocotillo (Fouquieria splendens) and the smoke tree (Dalea spinosa) that were observed to occur within the boundaries of the study area. This region is the only locale where the smoke tree occurs in the State of Nevada (Bradley, 1966). The most common specimens observed in the riverine environment and the flood plain were arrowweed (Pluchea sericea) and the introduced salt-cedar or tamarisk (Tamarix pentandra). The edible mesquites, honey bean (Prosopis juliflora) and screw bean (Prosopis pubescens) were noted growing in thick stands in some of the survey areas in the flood plain. The introduced tamarisk has already invaded tha mesquite forest and is crowding these nativa plante.

"The alluviam supports a desert shrub vegetation, typical of alluvial fans in the Mohave Desert...Annual grasses and weeds appear when precipitation occurs and conditions are ideal" (BLM Environmental Statement, 1975:24). The plant types common to the alluvial fans include creosote (Larrea divaricata), salt brush (Atoplex sps.), burro bush (Franseria dumosa), cat's claw (Acacia greggii), Jimson weed (Datura meteloides), desert spiny herb (Oxytheca sps.) and snakeweed (Gutierrezia sarothae). Other plants that were observed are the ground cherry (Physalis crassifolia), coyote melon (Cucurbita foesitissima), Mojave yucca (Yucca schidigera), and milkweed (Ascelpias subulata). Various cacti located within the area include barrel cactus (Echinocereus engelmanni), buckthorn cholla (Opuntia acanthocarpa), jumping cholla (O. bigelovii) and beavertail (O. basilaris). Many hardy specimens of pencil cactus (Opuntia ramosissima) appear to have reached an optimal height of 15 cm.

The fauna that inhabit this project area include fish, amphibians, reptiles, mammals and birds. The amphibians and reptiles consist of numerous lizards and snakes and other poikilotherms. The bird species found inhabit the area on both a year round and seasonal basis and it is a major migration stop for numerous species.

> Birds and waterfowl may be found primarily in the phreatophytic vegetation of the flood plain. Quail, hawks, vultures, mourning dove, owls, and numerous water birds and shore birds utilize the dense vegetation along the river. The sloughs and back water area inside the river levee system provides limited habitat for ducks, waterfowl and shore birds. Several species of snakes, lizards, frogs, toads and even turtles inhabit the subject area (BLM Environmental Statement, 1975:49).

Mammals that frequent the area include shrews (family Soricidae), jackrabbit (Lepus californicus), desert cottontail (Sylvilagus auduboni), Yuma antelope squirrel (Ammospermophilus harri species of mice (families Heteromyidae and Cricetidae), coyote (*Canis latrans*), desert kit fox (*Vulpes macrotis*), gray fox (*Urocyon cinereoargenteus*), badger (*Taxidea taxus*), bobcat (*Lynx rufus*), and bighorn sheep (*Ovis canadensis*) (Blair, et al., 1968).

Population size of the various faunal types is related to the environmental factors. In this area faunal population sizes are greater along the Colorado River in the flood plain and in the mountains rather than on the alluvial fan slopes. It should be noted that migration is probable between both environments by several species throughout the year.

> In general, the alluvial fan area with the desert shrub vegetation, provides habitat primarily for a small population of nocturnal desert wildlife, which would include small rodents, lizards, and insects. Because of the arid nature of the area, little wildlife is seen in daylight hours, with the exception of perhaps lizards. The flood plain provides more food, cover and water for wildlife habitat, thus producing a more varied population (BLM Environmental Statement, 1975:49).

> Geology - The primary geological features of the area can be divided into two parts: (1) consolidated rocks; and (2) alluvium. The consolidated rocks are a complex of Precambrian igneous and metamorphic rocks consisting of gneiss, schist, and granite, which form the Newberry and Dead Mountains to the north and southwest of the Fort Mojave area. Some Tertiaty sedimentary rocks consisting of non-marine clastics in some places interbedded with flow and pyroclastic rocks, and fresh water limestone are also formed.... All unconsolidated to semiconsolidated alluvial deposits cover most of the area, including the flood plain. This alluvium probably ranges in age from Pliocene to Recent, with most of the exposed material to be of Quaternary age. The alluvial aprons of the Colorado River Valley are underlain by lenticular beds of gravel, sand, silt, clay eroded from adjacent mountains. Coarse alluvial materials are contained in numerous washes cutting the alluvial aprons. Older alluvial terrace deposits, scattered lake deposits, and dissected alluvial fan deposits occur in the Colorado River Valley (BLM Environmental Statement, 1975:29 taken from Rush and Huxel, 1966, which conforms with Longwell et al., 1965).

It was noted during the survey that there is a high incidence of granitic float materials in the upper alluvial fans; in the higher section of the apron, there were a number of low outcroppings of granite boulders. These boulders were thought to be potential site areas, but they proved to be negative archaeologically within the survey sections. The coarse alluvial gravels mentioned in the geological quote from the BLM Environmental Statement include also well-rounded river cobbles that are incorporated in a number of the ancient river terraces identified on the western side of the Colorado River.

The Newberry Mountains, the Dead Mountains and their extensive alluvial fans dominate the landscape geologically in this region. The other major geological feature is the Colorado River basin, itself. In the alluvial fan area sheetwash seems to be the predominant erosional factor, although on the western edge of the project area, close to the San Bernardino County line, California-Nevada border, there is a well-developed major wash in Sections 19 and 24. Intensive survey was conducted along the edges and the banks above this major arroyo because of its site potential.

> Soils - The soils of the Fort Mohave area occupy two principal land forms: (1) river flood plain; and (2) alluvial fans. Soils on the nearly level flood plain are stratified, fine loamy sediments, for the most part superimposed in a few places by sand dunes....Joining the flood plain to the west are strongly sloping alluvial fans. The modern drainage system is deeply entrenched in these fans and tends to widen and form deltaic depositional areas where they join the flood plain....In general, the soils are coarse grained, derived mostly from granitic rocks. Depth to retrictive material and slope varies according to position on the fan (BLM Environmental Statement, 1975:24-25).

It was observed during the current survey project that the sand dunes are more extensive than stated in the BLM report, quoted above, particularly in the northern section of the flood plain where it abuts against the second river terrace.

> Topography - Topography can best be described as two major features: (1) the flood plain below the 510' contour line; and (2) the alluvial fan above 510' elevation....The alluvial fan starts at the 510' elevation at the west edge of the flood plain and rises in elevation westward up to the lower alluvial slopes of the Newberry and Dead Mountains, to a maximum height of 1,560' in the extreme northwest corner.... Numerous dry washes and channels dissect the alluvial materials on their way eastward to the Colorado River (BLM Environmental Statement, 1975:29) (See Topographic Map).

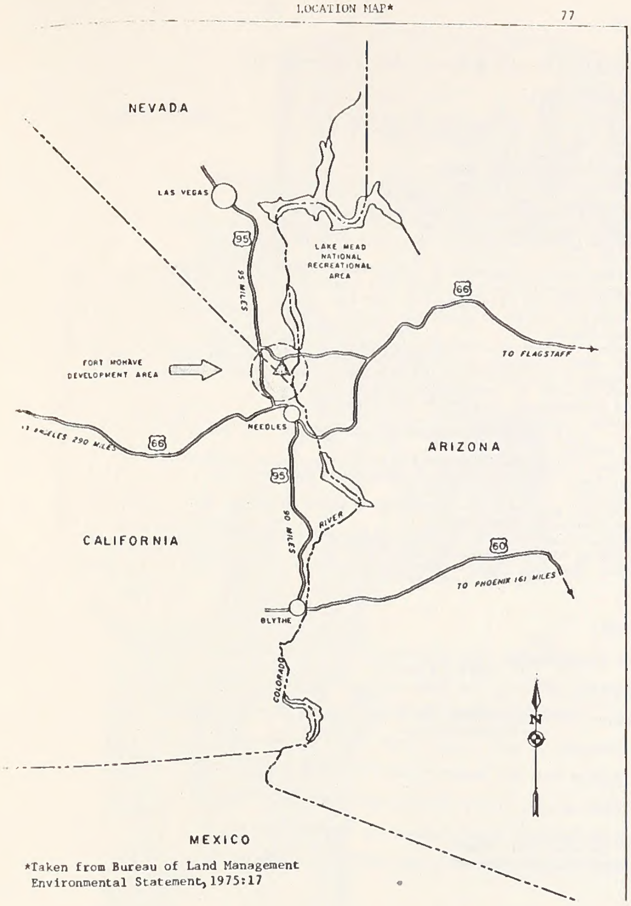
River terraces are another topographic aspect of the Fort Mojave terrain which relate closely to the archaeological survey. The lowest terrace lies between the 490' and 510' elevation and is in close proximity to the Colorado River. This terrace marks the beginning of the flood plain where it extends from the lowest river terrace to the 510' contour line where the second river terrace is located. The second river terrace continues to the 600' contour. The terrain between the lowest and the second river terrace consists of fine alluvial sands and loamy silts and is a relatively recent soil deposit. The second terrace is formed of cemented river gravels with surface substrates comprising a desert pavement. This terrace is being rapidly covered by alluvial wash from the higher fans and is heavily dissected along its eastern edge bordering the flood plain. Above the second terrace there are two ill-defined and one prominent ancient terrace formations which are remnants, partially buried in the alluvial fan overburden. The highest of these upper ancient terrace remnants appears as a distinctive landmark and all of these terrace remnants are readily identified in the topographic and the project maps. Approximate elevations for these ancient terraces are 540' to 580' for the lowest, the middle terrace remnants are at 600' to 680' and the highest and most prominent is at 800' to 880' elevation. The substrates on these terraces consist of gravel to cobble-sized materials composed mainly of crypto-crystallines and quartzites, heavily rolled and patinated. The surface is covered with the same types of materials which were utilized aboriginally as quarries for lithic workshop areas. These ancient terrace remnants represent the most important potential for archaeological site locales within this project area.

Above these ancient terraces the alluvial fan is heavily dissected by sheet erosion and contains no further evidence of exposed river terraces. There were no cobble substrates on the fan, where the major components consisted of granitic gravels.

LOCATION OF THE ARCHAEOLOGICAL SURVEY

The archaeological survey was conducted in the Fort Mojave area, located in the southernmost tip of Clark County, Nevada, on the west side of the Colorado River (see Location Map). Bullhead City and its southern extension, Big Bend, are situated on the east side of the Colorado River in Arizona. Big Bend is directly across from the project area. The Fort Mojave area can be reached either from Las Vegas via U.S. Highway 95, turning east on the Davis Dam Road, Nevada State Highway 77, or from Needles via a new paved road on the west side of the Colorado River that now connects with Nevada Highway 77. This road is designated as the PEW road on

LOCATION MAP*



*Taken from Bureau of Land Management Environmental Statement, 1975:17

the plastic overlays for the 7.5' series of topographic maps provided by the BLM. The PEW road bisects the project area.

> The legal description of the entire Fort Mojave project area includes:
>
> (1) All of sections 1, 12, and 13 and fractional sections 24 and 25, township 33 south, range 65 east.
> (2) All of sections 6,7, and 8, fractional sections 9, 10, and 15, east half, east half northwest quarter, and southwest quarter section 16, west half northeast quarter, west half, and southeast quarter fractional section 17, all of section 18, fractional sections 19, 20, 21, and 30, township 33 south, range 66 east (BLM Environmental Statement, 1975:1).

"Fractional" portions of a section mean that only a small piece of the section may not be included in the project area. These sections are located on U.S.G.S. topographic maps Mount Manchester, Nevada, California, and Arizona, 1970, 7.5 series, and Davis Dam Southeast, Arizona, Nevada, 1970, 7.5 series.

In the second phase of the inventory of the Fort Mojave area a less intensive or spot check survey was conducted in the unsurveyed units situated on the alluvial fan, which include the following (the section number is given first, with the quarter section number second, and each quarter section is considered a unit):

1-2, 1-3, 12-2, 12-3, 13-2, 13-3, 24-2, 24-3 and 25-2.

A more intensive survey was conducted in the following units:

9-3, 16-3, 8-2, 8-3, 17-2, 17-3, 20-3, 6-3, 7-2, 7-3, 18-2, 18-3, 19-2, 19-3, 30-2 and 30-3.

Areas excluded from the second phase of the inventory are the following units in the flood plain, covered with heavy vegetation:

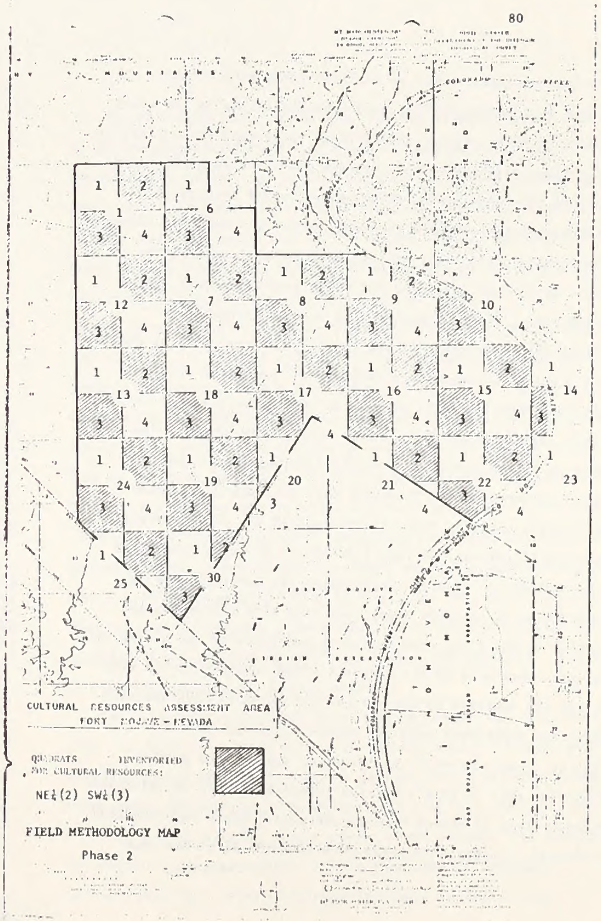
9-2, 16-3, 21-3, 10-3, 15-2, 15-3, 22-2, and 22-3.

A limited survey of adjacent lands was to be done if any site extended beyond the boundaries of the Fort Mojave area, but none were encountered. A series of brief reconnaissances were made in adjacent locales which appeared to have archaeological site potential, including the survey by the UNLV field class.

METHODOLOGY

During the first phase of the investigation of the Fort Mojave area knowledge of access roads, section markers, private land perimeters and other essential data had already been obtained. Consequently the second phase of this inventory project was facilitated by this information. The available roads include transmission line roads, gas line roads, paved roads, levee roads, mining roads and jeep trails, all of which were utilized during both phases of the survey. Private land is located in the NW corner of Section 16 and the NE corner of Section 17 and during the second survey, contact was made with the caretaker. The caretaker had lived in the region for some time, and he believed that an elderly couple named Cunningham, may have been buried in the historic cemetary, located on the private land. He had also heard that Indians may have been buried in this cemetary.

A systematic approach to the units less intensively surveyed was maintained through individual crew members walking zig-zag fashion within transects not larger than 50 meters in width. In those units that were being intensively surveyed, the field crew members walked parallel transects at 10 to 20 meter intervals. As in the first inventory, the banks of washes or arroyos and the ridges above them were closely examined during the survey. When archaeological sites or isolated finds were encountered concentric circles around each locale were walked to determine if there were additional materials, and to locate the perimeters of the site. In the few



instances where granitic boulders or small hills occured within the survey units, these were checked for shelter sites and/or rock art manifestations.

The survey sample unit designation described in the first survey report is utilized in this second investigation. B.W. Hatoff, now with the Carson City District Office of the BLM, and D.O. Larson, now with the Ukiah District Office of the BLM, devised the unit designation in a consultation prior to the first phase of the field research. Section numbers are utilized as sample unit numbers and these are broken down into their four quarters; the northwest quarter being 1, the northeast quarter, 2, the southwest quarter, 3, and the southeast quarter 4. Each survey unit then can be designated as 12-1, 12-2, 12-3, or 12-4. During the first phase of the inventory all the northwest quarters and southeast quarters of the sections or portions of sections located in the project area were surveyed. In this second phase of the investigation all the northeast quarters and southwest quuarters. On the field methodology map these are indicated as "12-2", "12-3", etc. The site discussions, descriptions, results and recommendations will utilize these unit designations for identification.

It was determined, as with the first survey, that should isolated lithic or sherdware be encountered, it would be collected, but that percussion or cobble materials would be left in situ. Following the contract performance description artifact collection also was limited to unique or possibly diagnostic artifacts.

ARCHAEOLOGICAL SITE DESCRIPTION

In order to quantify the site data generated by this project, the following format has been organized for the purpose of

archaeological site discussion; this material is presented for easy retrieval also in Table 1:

1. Permanent BLM Site Number (CR-NV-05-389)
2. Permanent NSM Site Number (26CK1407)
3. Survey Unit Number (1-3)
4. Elevation from mean sea level
5. Location: township, range, section, quarters of quarter sections
6. Site Type, including any of the following or combinations:
   A. Lithic- Any site containing lithic artifactual materials, including lithic concentrations as well as large to small scatter area.
   B. Lithic Quarry Workshops - Sites where rock cobbles and/or crypto-crystalline materials were quarried and prepared in the process of artifact manufacture.
   C. Ceramic - A site at which one or more pottery sherds were found.
   D. Historic - Any site at which historic debris such as tin cans, crockery, and house foundations are found.
   E. Isolate - Usually a single artifact or small concentration with no association to a site area.
7. Area of Occupation: extent of surface coverage.
8. Map Number : project map.
9. Plates: plate number in regard to photographs utilized in the report.
10. Situation: includes geographic situation and site location.
11. Description: includes metric measurements and direction orientation.
12. Deposition: includes an estimation or speculation of possible subsurface materials.
13. Artifacts: includes any cultural materials that were recorded in association with the site.
14. Remarks: includes present physical situation of the site.

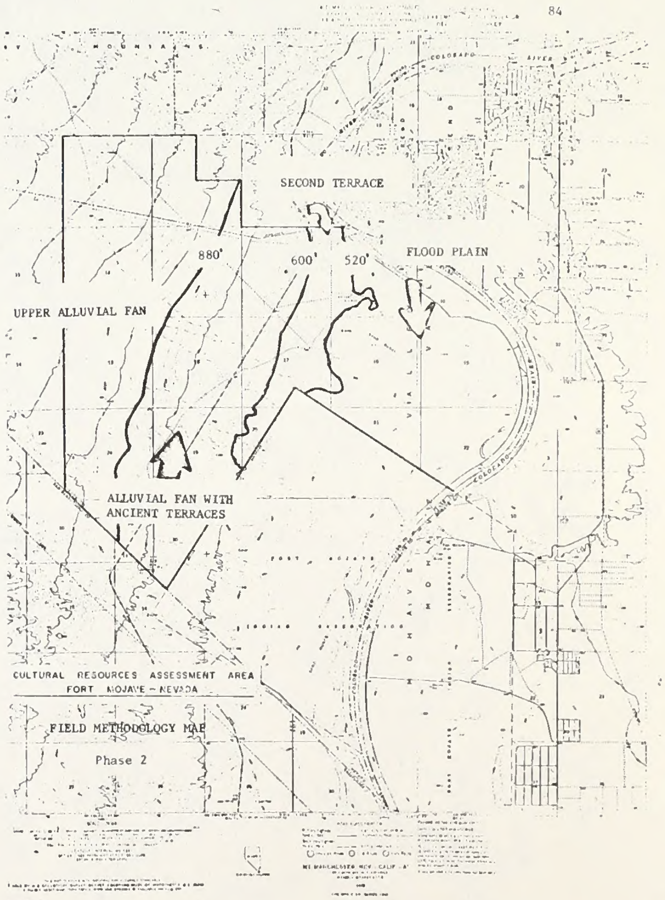
RESULTS OF SURVEY

The second phase of this investigation located in the Fort Mojave area involved basically two types of physiographic terrain. The Colorado River flood plain with its dense growths of vegetation, which was not surveyed in this second phase of the project, and the alluvial fan sloping from the Newberry and Dead Mountains towards the Colorado River valley, with a sparse vegetation cover. During the first phase of the Fort Mojave project in the Colorado River flood plain, which composed approximately one-third of the survey

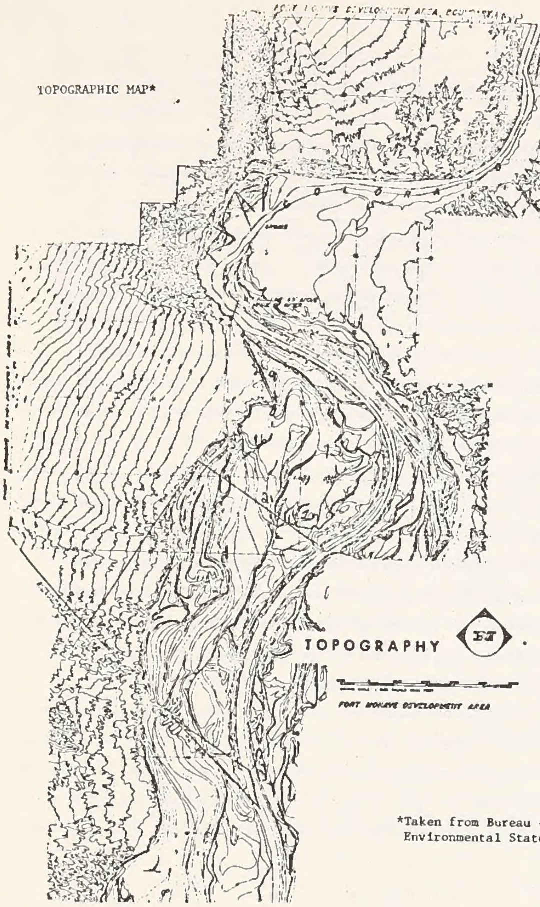
area, no archaeological sites or isolated finds were located. It was assumed that these negative data probably relate to the heavy brush and tree cover and the depositional overburden characteristic of the sections adjacent to the Colorado River. Even in the dune areas within the flood plain, which generally are considered potential archaeological site locales, there was a complete absence of archaeological materials. There are occasional open spaces in which sand dunes have collected and these were re-checked during the second phase of the inventory with negative results.

During the first phase of the investigation a number of historic and prehistoric sites were recorded on the second river terrace just above the flood plain. No additional sites or isolated finds were located along that terrace area in the second phase of the survey, with the exception of a single artifact encountered in a previously recorded site. In survey unit 9-4, BLM Site Number 401, which is a historic dump off the edge of the second terrace, a granitic slab metate, 16" long x 8" wide x 3" depth, was noted among the rusted can debris. This metate was not collected, but was recorded as an isolated aboriginal find in a historic site. At the time of the field work on the second phase of the survey, it was observed that many of the historic sites, especially the dump sites were not confined to the survey unit in which they had been recorded, but overlapped into the adjacent quarter sections.

In the upper portion of the alluvial fan, in the quarter sections that were to have a limited intensity survey two additional isolated finds of sherds were encountered. These were recorded and collected. In Unit 1-2 there were five sherds of the same



TOPOGRAPHIC MAP*



*Taken from Bureau of Land Management Environmental Statement, 1975:21

type, two of which are rim sherds, and they were identified tentatively as Tizon Brown Ware. A single sherd, of Lower Colorado Buffware, was located in Unit 1-3, 30 feet south of the Bench Marker 1349. At the Bench Marker, itself, a single black basalt metate fragment was found, about 6" in diameter. It had been utilized to form the rock cairn around the Bench Marker. The metate fragment was recorded, but let in situ. These are the only artifact materials that were encountered during the second phase of the survey in the upper sections of the alluvial fan. Two U.S. Army unopened food ration cans were found, and related to manouvers held in this area about 10 to 20 years ago.

In Units 18-2 and 18-3 additional river terrace remnants were located. On these exposed ancient Colorado River terraces occuried quartizite and other crypto-crystalline cobbles. These cobbles showed evidence of percussion battering and the locales are considered quarry site areas, as described in the report for phase one of this inventory. In Units 19-3, 17-2 and 17-3 isolated cobble choppers were encountered. In Unit 17-3 a small workshop of battered cobbles was found within a 2 meter in diameter area. Since a representative sample of cobbles had been collected during the first phase of the investigation, all of these finds were left in situ, after they had been recorded.

SUMMARY

There are no known recorded National Register archaeological sites within the area specifically designated by the BLM for the Fort Mojave area under consideration in this second phase of the cultural resource inventory project.

In the second phase of the investigation of the Fort Mojave area for an inventory of cultural resources the results confirmed the first phase of the survey. On the upper alluvial fan, in the western portion of the survey area,

only a few additional pottery sherds and a single ground stone artifact fragment were encountered. In the mid-section between the high portion of the alluvial fan and the second river terrace two additional ancient river terrace remnants were located in alignment with the river terrace remnants recorded during the first of the survey. Both of these are further indicators of the use of these terrace remnants as potential quarry sources by the prehistoric inhabitants of the area. No additional sites were recorded on the second river terrace, which had been heavily utilized both historically and prehistorically. A metate was found in association with one of the previously recorded dump sites.

As discussed in the report on the first phase of this inventory of the Fort Mojave area the second river terrace, which is the lowest extension of the alluvial fan just above the flood plain, contained all the historic sites located during both phases of the survey. One of the most significant historic sites on the second terrace is the cemetery where it has been said that a couple named Cunnigham were buried, and possibly two or more Indians.

During a one day reconnaissance of the historic trails in the project area with Stan Rolf, Las Vegas BLM District Office, Dennis Casebier and ARC staff, two historic surface artifacts were located adjacent to the dirt trail which represents the remnant of the Hardyville branch of the Mojave Trail. One was the base of a piece of thick crockery which resembled examples of historic beer crocks that Casebier had found in the Camp Cady area. Thia historic artifact was collected at a short distance from the east side of the road and within the project area. A mile west, and just outside the project area, a historic square bottle base was located, similar to a medicine bottle, also adjacent to the Hardyville branch of the Mojave Trail (see Brooks' letter, 12/20/77).

The prehistoric sites on the second terrace found during the first phase of the inventory consisted of lithic quarry workshops, lithic scatters and concentrations and some rock outline features. There were isolated finds of both ceramics and lithics recorded and collected. One isolated metate was recorded during the second phase of the survey. All the prehistoric sites appear to be surface sites, based on the examination of arroyo cuts through the second terrace and their situation on desert pavement.

During phase one of the survey the quarry areas that were encountered, were confined, for the most part, to the ancient exposed Colorado River terrace remnants (see Project Map BLM site numbers 413 to 423). In the second phase of the survey two additional terrace remnants, related to the same terrace exposure, were recorded and evidence of associated quarrying activities was observed. Lithic materials collected or observed during both phases of the Fort Mojave survey are characteristic of a percussion flake and tool technology. Lithic material consists mainly of large percussion flakes recovered from cobbles, randomly flaked cobbles and cobbles exhibiting minimal unifacial and bifacial flaking along edges formed by percussion. Microscopic utilization evidence, when present, was of battering. Quarry material consists of several varieties of quartz including chert, chalcedony, and quartizite. A few objects were made from porphoritic igneous material.

The flood plain east of the second terrace probably has no surface material older than forty years since historical records indicate a lateral shift of the river channel some 2,000 meters to the east, over most of the modern flood plain. The Colorado River channel as plotted by Swanholm in 1932 places it near and parallel to the present second terrace. The sediments on the surface of the present flood plain are probably the results o

tion of a point-bar. Such sedimentary structures are deposited by movement of a stream channel, which will cause erosion and cutting in the direction towards which the river is moving, while on the opposite bank deposition is occurring. Subsurface archaeological material should be found only in the older sedimentary sequences which lie below the modern deposition resulting from the point-bar in the Colorado River Valley Fort Mojave area between 1932 and the present. This might then be the explanation for the paucity of the sites in the flood plain here that Schroeder mentioned in his 1951 report, and possibly why no sites were encountered during the first inventory of the Fort Mojave area by the NAS, when an attempt was made to survey quadrats in the floodplain.

No culturally or chronologically diagnostic phehsitoric lithic or ground stone artifacts were encountered in either phase of the Fort Mojave inventory project. The only prehistoric cultural material found, which could be considered diagnostic, was the sherd ware. The pottery sherds were mainly identified as Lower Colorado Buffware, some with a stucco finish. This ware was made by Yuman groups along the Lower Colorado River and Schroeder (1951) had dated it at pre-900 A.D. to post-1900 A.D. The other sherd ware represented in the ceramic finds is Tizon Brown Ware. This ware has been attributed to the Upland Arizona Yuman Indians by Dobyns and Euler (1958). They date Tizon Brown ware at about 700 A.D. to 1890 A.D.

Both phases of the Fort Mojave area project were essentially an inventory of cultural resources located within a delimited area in relatively close proximity to the Colorado River. Now that the inventory has been completed, historic and prehistoric sites recorded, the limited prehistoric artifacts catalogued or inventoried, there still remains one major archaeological problem. This concerns the highest ancient visible terrace remnants of the Colorado River in this area, on which are located prehistoric quarries. The

material in these sites is not readily identifiable, but is is obvious that an extended lithic technology occurred here, and the problem is to identify this technology and its significance in the prehistory or even ethno-history of this portion of the Colorado River. As recommended in the report on the first phase of the inventory this will necessitate a study oriented towards identifying the manufacturing techniques involved and isolating the elements of preparation and the use or non-use of cobbles. Similar quarry sites have not been encountered during previous surveys in this section of the Colorado River, neither those conducted by members of the ARC staff nor were they noted in the literature reviewed that related to this project area. The quarry sites recorded by Larson et al (1976) on the Arizona side of the River are not based on the quarrying and use of ancient river terrace cobble materials similar to those quarry sites in the project area.

It should also be stated that if Wheeler's 1869 map of Camp Mojave showing rancherias in the flood plain west of the Colorado River, did indeed refer to Mojave Indian settlements. Then on the basis of the subsequent sedimentary deposition, all of this ethno-historical material would now be buried in the present Colorado River sedimentry deposits or scattered by the frequent floodings that must have occurred prior to dam construction on the upper River. The ethnological information indicates that few encampments were occupied year round or could be considered permanent villages.

RECOMMENDATIONS

There is a continued debate in archaeology as to the significance of stone implements found on Colorado River terrace quarries. Their function and antiquity is still dubious as these quarries usually have no depth and no chronologically diagnostic materials. In some respects the problem is taphonomic and will necessitate detailed studies of the geological and geographical modifications of the landforms through time, to determine the associational interpretations of these modified river cobbles in the quarries. The cultural element of relating these cobble workshops to human activity is another source needing exploration. So little is known or has been studied in a concentrated locale where numerous quarry areas are located along the Colorado River, that resource studies related to their interpretation and ramifications could prove significant to the prehistory of this region. In this sense these quarry areas are unique as a study area in this section of the Colorado River, since they are, as yet, relatively undisturbed.

The historic sites recorded appear to have artifacts indicative of late 19th century and early 20th century, some being more recent. All the ethno-historical data and the early maps show Indian "rancherias" in the flood plain and the lower alluvial slopes of the subject area, although the river flooding, lateral shifting of the river channel, river dike construction, and associated vegetation have destroyed this evidence. It is probable that any proposed alteration of the present landscape involving excavation would exposed subsurface historic or prehistoric materials in the flood plain.

A number of questions regarding the physical integrity of the Mojave Trail, its associations, and its scenic significance were asked of Dennis Casebier during his consultation and he evaluated these in a letter of reply (12/17/77):

> Another question that has been raised is whether or not the road presently retains its physical integrity---both inside and outside the

> subject lands. A unique characteristic of this route of travel is that it exists across the Eastern Mojave Desert (in California and Nevada) today in very nearly the same condition it was in a hundred years ago. The reason for this is that when the Southern Pacific Railroad was built across the desert between Needles and Barstow (this is the line that is now the A.T.&.S.F.R.R.) in the early 1880s the line used was displaces twenty miles or so to the south of the line of the Mojave Wagon Road. The reason for this was that the wagon road would climb steep hills and mountains to reach the few reliable springs of water. The railroad could not climb these mountains and didn't need to anyway---water supplies could be developed for the railroad or water could be hauled. Either of those alternatives was preferable to the massive work of road construction in mountains or climbing steep grades. Once the railroad was built wagon traffic and later auto traffic began to follow the railroad. The Mojave Road fell out of use. Consequently the modern highway across the desert (Interstate 40 between Barstow and Needles) evolved from the track of the Santa Fe Railroad instead of from the Mojave Road.
>
> From Camp Cady (about twenty miles east of Barstow) eastward to the Fort Mojave crossing (a distance of 130 miles) the trace of the old wagon road passes through country largely unchanged since the old days. Some segments of it have continued to serve local traffic needs, but for the most part it is quite isolated and has been abandoned for a long time.
>
> Throughout most of this 130 miles the road is on public land administered by the Bureau of Land Management. About 115 miles are in California and the last 15 or so before you reach the river are in Nevada.
>
> Another question...is to comment on feelings about what might be called the scenic integrity of the Mojave Road as it exists today. The interest is to determine whether or not it has the same 'feel' about it that it might have had a hundred years ago. The concern is that the works of man might have intruded upon the scenic quality of the region to the extent that it has lost it original character. The bluff upon which Fort Mojave was situated is visible for many miles and the greenery and windings of the Colorado are visible as soon as you cross the ridge north of the Dead Mountains....
>
> There is no question but that, to some extent, the works of man have intruded upon the feel and appearance of the country through which the trail passes. Mostly this is in the form of utility lines and corridors and fences and modern roads. Of course it is well known that utility corridors in the form of power transmission lines, gas lines, underground communication lines, and others have been built helter-skelter all over the desert. It is clear that adequate consideration has not been given to the impact of these lines on the scenic resources of the desert. There isn't hardly any corner of the desert that has escaped these intrusions upon the scenic quality.
>
> Intensive development will unquestionably negate the remaini
> values associated with the Mojave Trail in the entire region
> the Dead/Newberry Mountains....the negative effects go much f

> just in the Mojave Valley. The preservation of the Fort Mojave crossing---and the approaches leading to it---is vital to successful preservation and use of the entire trail. The Mojave crossing is the heart of the matter in many ways and if that is lost then the whole will be greatly weakened.
>
> The highlights of the historical resources of this region should not be overlooked. As mentioned earlier, Fort Mojave was one of the most important crossings of the Colorado River in the years before bridges and dams. It is the only important crossing of the Colorado still in isolated and in nearly original condition. The others are either inundated by lakes or else cities have grown up around them. Certainly it is the only such crossing available to the people of Nevada. So the general area is of the greatest historical importance as one of the great river crossing points. It would be an ideal location for the difficulties of early river crossings to be interpreted and where visitors could be made more fully aware of the great changes that have taken place in the valley of the Colorado since the building of the dams.

On the basis of the prehistoric and historic materials recorded in the project area any proposed developments would constitute an adverse effect on one or more of the identified cultural resource values that relate to criteria established by 36 CFR 800.9. Virtually any development or alteration of these lands, that is not oriented towards preserving or conserving the identified values would probably rèsult in "...destruction or alteration of all or part of a property" (36 CFR 800.9,a); "its surrounding environment" (36CFR 800.9,b); "introduction of visual, audible, or atmospheric elements that are out of the character with the property or alter its setting" (36 CFR 800.9,c); and possibly "neglect of a property resulting in its deterioration or destruction" (36 CFR 800.9,e).

The sections of the federal law (36 CFR 800.9) quoted in the preceding paragraph apply particularly to the historic materials encountered during the cultural inventory of the Fort Mojave project area, The Mojave Trail was traced through these lands during the inventory, and the historic sites recorded in the first phase of the inventory on the second terrace, will need positive action to preserve their integrity. The prehistoric sites are visible and of

a fragil nature and must be included in any protective measures for the area.

To insure that compliance with the federal laws occurred, and that as much information~~s~~ as possible relating to the historic and prehistoric materials encountered during this inventory be given to the Nevada State BLM Office, copies of the first phase and the preliminary second phase report were sent to the tribal council chairmen of the Colorado River Indian Tribes at Parker, Arizona, and the Fort Mojave Indian Tribe at Needles, California. Both chairmen were requested to telephone the Nevada State BLM Office to make any comments or give any information they or members of their reservations had with regard to these project lands.

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(PAGE 100 THROUGH 104 NOT INCLUDED)

THE MOJAVE TRAIL: AN HISTORICAL BACKGROUND

Compiled by

Phillip I. Earl, Nevada Historical Society

November 14, 1977

The Mojave Trail between Fort Mojave on the Colorado and Fort Pah-Ute in California apparently traverses some natural passes inasmuch as it was an Indian trail long before the coming of the white man. The Spanish explorer, Francisco Garces, probably passed along parts of the trail in 1776 in his search for a route from New Mexico to Spanish California. Reports on subsequent use by Spanish and later Mexican explorers and traders are inadequate and spotty, but it is likely that the route was in periodic use, although never a major route due to Indian problems in the area. The Sonora Route to the south was preferred by those making their way west because of fewer Indian problems and more easily-traversed terrain. After 1825, the early years of the Mexican period, this latter route was used extensively.

The first Americans known to have made use of the Mojave Trail was fur and trapper and mountain man Jedediah Strong Smith of the Rocky Mountain Fur Company. Exploring and trapping on the Colorado River in the late summer and early fall of 1826, he led a party west from the river to San Gabriel in Mexican California in September of that year. Smith returned east on the trail in February of 1827, but cut off to the north before he reached the section we are concerned with. Canadian trappers under the leadership of Peter Skene Ogden of the Hudson Bay Company made use of the Mojave Trail in 1829, as did Ewing Young and Kit Carson in the fall of that year. Another trapper, Richard Campbell, traveled the trail in 1830 and Thomas "Peg Leg" Smith was probably on the trail at this time also.

The opening of the Old Spanish Trail to the north in 1830 less on the routes to the south. The Old Spanish Trail was also the primary route for Americans coming west during the California Gold Rush after 1849, although some travel on the Mojave Trail probably continued throughout the 1840's and 1850's. The Old Spanish Trail had distinct advantages over those to the south, the foremaost being more springs and sources of water and less trouble with the Indians.

In the early 1850's, the United States began surveys of the West looking toward the construction of a trans-continental railroad. In March of 1854, a survey party under the leadership of Lieutenant Amiel Whipple of the U.S. Army Topographical Corps reached the Colorado River from the east and were led over the Mohave Trail by an Indian guide. The trail was surveyed and suggested as a practical railroad route, but further appropriations to develop the route were not forthcoming for another three years.

In 1857, the War Department got an appropriation to construct a wagon road from Fort Defiance, New Mexico Territory, across what is today northern Arizona and southern California. Edward Fitzgerald Beale, a former naval officer, was put in charge of this project and in 1858 and 1859, he followed up on the previous explorations of Lieutenant Whipple. A practical wagon route was laid out at that time by Beale and his party.

Beale's route was the object of considerable publicity and various California-bound traders and immigrant parties began to make use of it. The U.S. Postal Department established a mail route on the Mojave Trail in 1858, but abandoned it by mid-1859 because of troubles with the Indians. Immigrant parties were also experiencing trouble with Mojaves and in April of 1859, Fort Mojave was established on the east bank of the Colorado River at Beale's Crossing, the eastern anchor of the Mojave Trail. Fort Mojave continued to function until May of 1861 and troopers from the fort patrolled the trail to

the west. There was considerable military and civilian traffic on the trail during this period because it was the only route from California into the area of what is today northwestern Arizona. Considerable exploration for mineral wealth was underway in this area in the late 'Fifties and early 'Sixties and in 1862, the El Dorado Canyon District was opened up. Although river steamers had begun to haul most of the supplies and passengers destined for the northwestern Arizona by the early 1860's, the Mojave Trail was still heavily used. In 1864, Prescott became the capital of the Arizona Territory and there was much traffic on the trail from that place to southern California in subsequent years.

Fort Mojave had been re-activated in May of 1863 and cavalrymen once again took up patrols of the Mojave Trail. Patrols operating out of Camp Whipple at Prescott also worked the trail and in November of 1867, an outpost was established at Pah-Ute Springs, twenty-five miles to the west of Fort Mojave on the Mojave Trail. Several outposts were established along the trail in the spring of 1868 and were subsequently occupied by cavalrymen operating out of Fort Mojave, Camp Prescott and California military installations, although Pah-Ute itself was abandoned in April of 1868.

As river traffic became heavier in the 1870's, travel on the Mojave Trail fell off and its condition deteriorated. Appeals to Congress for funds to maintain the trail were unheeded and it was all but abandoned. In the 1890's, Pah-Ute Springs became a popular picnicing and swimming spot for the people of Needles, California and after the introduction of the automobile about 1906, these vehicles traversed the Mojave Trail on recreational excursions for several years.

As to historic remains and artifacts on the stretch of trail between the west bank of the Colorado River and Pah-Ute Springs (or Pah-Ute Creek as it

appears on some maps), it seems that there might be found the remains of temporary military outposts, supply caches and camps established by traders and immigrant parties. Cattle and sheep have also been driven over the Mojave trail from time to time and the remains of corrals or temporary enclosures are also a possibility. Some farming has been attempted in the Pah-Ute Springs area and there was a turkey farm there in the 1950's. Military buttons, guns, sabers, pieces of military harness, parts of wagons and other such materials would very likely be found along the trail as well. The last time this writer was over the trail in the early 1960's, it was in extremely bad condition.

As to the maps I have enclosed, in Township 33 South, Range 65 East, the road crosses the southeast quarter of Section 12, the southwest tip of the northeast quarter of this section and cuts diagonally across the northwest quarter into Section 11. In this section, it crosses the northeast tip of the southeast quarter before passing into Section 2. In this section, the road cuts across the southwest tip of the southeast quarter and the center of the southwest quarter. The road to Hardyville cuts off to the northeast in this latter quarter. Hardyville was established as a port on the Colorado River in 1864, the date of the road also. From Section 2, the road crosses Section 3 at the north edge of the southeast quarter, cuts across the southwest tip of the northeast quarter and crosses the northwest quarter at a slight northwest angle. The road crosses the next section, Section 4, slightly to the north center portion of the northeast quarter and cuts across the northeast tip of the northwest quarter before moving into Township 32 South, Range 65 East. It enters Section 33 at the southwest tip of the southwest quarter and enters Section 32 in the southeast quarter. Angling north, it crosses the northeast quarter of Section 32 and enters Section 29 at the southwest corner of the southeast section. Crossing the southwest quarter of Section

29 at a northwest angle and cutting across the southwest tip of the northwest quarter before entering Section 30 across the center of the northeast quarter, the road angles north across the southwest tip of the southeast quarter of Section 19, angles north across the northeast tip of the southwest quarter of this section and enters the northwest quarter. In this latter quarter, the road angles to the west and enters California.

The two maps from which this data was taken date from surveys completed in 1882 and the section designations are different from those on the current Davis Dam Quadrangle. I have copied and enclosed the old maps and have also copied a section of the Davis Dam Quadrangle on which I have sketched the location of the old Mojave Road as nearly as I can determine it from the maps and my research.

Old survey maps for Section 7, Section 18 and Section 17 on the Davis Dam Quadrangle do not exist, at least not at the Bureau of Land Management office in Reno, so you might begin where the old maps I have enclosed start in Section 12 and work your way east through the southwest corner of the southwest quarter of Section 7, the northeast corner of the northeast quarter of Section 18 and follow it through Section 17 on to the Indian Reservation. As I mentioned on the telephone, Dennis G. Casebier is the authority on the history of the Mojave Trail. His book, The Mojave Road (Norco, California: Tales of the Mojave Road Publishing Company, P.O. Box 307, Norco, California, 91760), is the most complete study of the subject to date. Gary Roberts at our Southern Nevada Office would have his address. If the nature of your project were explained to him, I am sure that he could help.

As to information on the history of the Mojave Trail and adjacent areas in the Twentieth Century, it would be partly a matter of digging i [illegible] newspapers in the Las Vagas area and in Kingman, Arizona and in

Maps, deeds, land titles, ranching and agricultural information would be available in the records at the Assessor's Office and at the County Recorder's office in Las Vegas. The newspaper research would take a considerable amount of time, but the other research might well be right at hand. If I were approaching this, I would go to the county records first and then follow up with research in the newspapers.

The tank tracks you have been finding are of World War II vintage when General George Patton conducted military exercises throughout southern California and in this area of southern Nevada. His headquarters was at Camp Baker near Barstow, California, but training was conducted in several desert areas.

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APPENDIX E

CULTURAL RESOURCES:
106 COMPLIANCE LETTERS

HP&A
THE NEVADA DIVISION OF HISTORIC PRESERVATION AND ARCHEOLOGY
201 South Fall Street, Nye Building, Room 116, Carson City, Nevada 89710
KIMBERLY WOOD, Administrator Telephone (702) 885-5138

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES NORMAN HALL, Director

MIKE O'CALLAGHAN
GOVERNOR

March 20, 1978

Louis S. Wall
Office of Review and Compliance
Advisory Council on Historic Preservation
P.O. Box 25085
Belmont Station
Denver, Colorado 80225

Dear Mr. Wall:

We recently received correspondence from the Nevada State Office, Bureau of Land Management dated February 7, 1978 relating to the proposed sale of Fort Mohave land to the State of Nevada. As we understand it, the BLM does not presently have an "undertaking" since the Secretary of Interior has not passed on the potential sale. Once the Secretary has had an opportunity to comment then we and the BLM will know if there is an "undertaking". Until such time, the actions proposed by the BLM appear to be in compliance with the Advisory Council for a determination of effect and design of appropriate mitigation measures.

In regard to the mitigation alternative presently being considered, we have certain reservations. It would seem that the basic assumption in Mr. Rowland's letter and the environmental statement is that requirements for specific development related mitigation will be passed on, as part of the sales contract, to the buyer. From that point on, all responsibility for site preservation and mitigation would fall to the Nevada State Divisions of Colorado River Resources and Historic Preservation and Archeology. While this type of lateral transfer may be a viable mechanism in some states, I question its utility in Nevada.

Recycling
Nevada's Heritage

It would be our recommendation to the BLM that they explore the feasibility and cost of a data recovery plan for the resources involved in the sale parcel. California and Arizona State Historic Preservation Officers should be consulted to see if other sections of the government road are presently on the National Register or are being considered for nomination. This fact may have some bearing on the nature of the data recovery techniques proposed for that resource.

Sincerely,

Kimberly Wood

KIMBERLY WOOD
State Historic Preservation Officer

cc: E.I, Rowland, State Director
Nevada State Office
Bureau of Land Management
Room 3008 Federal Building
300 Booth Street
Reno, Nevada 89509

KW:sb

Advisory Council on
Historic Preservation
1522 K Street N.W.
Washington, D.C. 20005

February 22, 1978

Mr. E. I. Rowland, State Director
Nevada State Office
Bureau of Land Management
Federal Building, Room 3008
300 Booth Street
Reno, Nevada 89509

Dear Mr. Rowland:

This is in response to your letter of February 7, 1978, informing the Council of the steps and proposed timetable the Bureau of Land Management plans to follow to comply with Section 106 of the National Historic Preservation Act (16 U.S.C. 470f, as amended, 90 Stat. 1320) and Section 2(b) of Executive Order 11593, "Protection and Enhancement of the Cultural Environment," as applicable to the possible sale of the Fort Mohave Lands, Nevada.

We have reviewed the contents of your letter and the draft Final Supplement to the Final Environmental Statement for the action under consideration. It is noted that BLM has determined it would be premature to obtain the Council's comments pursuant to Section 106 and Executive Order 11593 until the sale has actually been proposed. We also note that BLM recognizes its responsibilities pursuant to the Federal preservation authorities and will undertake the steps for compliance once a decision to propose the sale has been made. Accordingly, we look forward to working with BLM in accordance with the "Procedures for the Protection of Historic and Cultural Properties" (36 C.F.R. Part 800) as necessary in the future.

Nevertheless, pending receipt of the Council's comments, the Council requests BLM refrain from taking any action which would foreclose proper Council consideration of those alternatives, including the no sale alternative, that would avoid adverse effects on cultural properties included in or determined on the authority of the Secretary of the Interior to be eligible for inclusion in the National Register of Historic Places. Should you desire to discuss this matter further, please contact Michael H. Bureman of the Council staff at P. O. Box 25085, Denver, Colorado 80225, or at (303) 234-4946, an FTS number. Your continued cooperation is appreciated.

Sincerely yours,

Louis S. Wall

Louis S. Wall
Assistant Director, Office of
Review and Compliance, Denver

The Council is an independent unit of the Executive Branch of the Federal Government charged by the Act of October 15, 1966 to advise the President and Congress in the field of Historic Preservation.

APPENDIX F

SOCIAL AND ECONOMIC CONDITIONS RELATED TO THE FORT MOJAVE INDIANS

Prepared by:

Judy Nelson, BLM Regional
Economist, Nevada State Office
David Loomis, BLM Economist,
Las Vegas District Office

INTRODUCTION

The purpose of this report is to analyze the social and economic impacts on the Fort Mojave Indians of the proposed sale to the State of Nevada of 9,000 acres of public lands administered by the Bureau of Land Management.

The subject lands are adjacent to the Nevada portion of the Fort Mojave Reservation. The State of Nevada, through the Nevada Division of Colorado River Resources, is acting as an intermediary in the eventual private disposition of the area. A complete description of the proposal can be found in the Final Environmental Statement for the Sale of Fort Mohave Lands to the State of Nevada (FES 75-10) filed with the Council on Environmental Quality on January 23, 1975.

A general discussion of social and economic impacts can be found in the above mentioned document, while this report only discusses the social and economic impacts on the Fort Mojave Indians.

CULTURAL AND HISTORICAL BACKGROUND

The Mojaves were the largest tribe associated with the Yuman linguistic and cultural stock. They lived in small villages along the Colorado River ranging from the Lake Mohave area to Parker, Arizona. The most heavily and consistently populated area was the Mohave Valley, or roughly the Colorado River Valley from Davis Dam to Topock.

The Mojaves practiced a form of agriculture similar to that of the ancient Egyptians. The yearly flooding of the Colorado River irrigated and fertilized the bottom lands where the Mojaves planted corn, beans, pumpkins, watermelons, and cantaloupes. This accounted for about 50 percent of their diet, with the rest provided through fishing, hunting, and gathering mesquite beans.

The Mojaves engaged in trade throughout a large area of the Southwest; however, they did not trade in large quantities, so it appears the major motivation for their travels was curiosity. (Smith, 1966.)

Mojave children were socialized into the tribe at an early age, being encouraged to establish a large number of contacts throughout the tribe. This resulted in a loose family structure, but a strong tribal structure. The Mojaves were able to function as a strong nationalistic organization, which contributed greatly to their success in military campaigns. (Devereux, 1961.)

Mojave religion was informal, without personalized gods or ritual dances. Dreams were important forces in their lives, whether actual nighttime dreams or continued thoughts or flashes of insight. These dreams, often connected with traditional legends, were told to the tribe at community sings and tellings. Many Mojave legends attached religious significance to the geological features of the area. (Grey, 1970; Kroeber, 1923.)

Deceased Mojaves were cremated along with their hut and their possessions, a manifestation of the Mojaves' antimaterialism. The Mojaves shared what little possessions they had, and stinginess was considered a violation of basic human ethics. (Devereux, 1961; Hrdlicka, 1908.)

This antimaterialism expressed itself in their attitude toward work. The Mojaves valued a balance between work and leisure. The Mojaves would work hard when necessary; leisure time was used for contemplation and relaxation. Their way of subsistence allowed them to pursue a different life-style than some of the California Tribes. (Devereux, 1961; Kroeber, 1923.)

Marriage was more of a "living together" than a formal bond between two people. Some marriages were unstable, and when a couple tired of living together tribal customs allowed them to split up and move in with someone else. Marriages with non-Mojaves were rare and greatly frowned upon, reflecting the strong tribal structure. (Kroeber, 1923.)

The Mojave Indians were divided into a number of different clans, but the individual was identified on the basis of his relation to the tribe as a whole, not to a particular clan. Other than a prohibition against marrying within the clan, the clans had little effect on day-to-day life. (Kroeber, 1923.)

The Mojave Indian society remained relatively stable until 1859 when Fort Mohave was built. Prior to this there were sporadic contacts with whites, for the most part friendly, but there were occasional violent incidents. The increasing frequency of these violent incidents prompted the U. S. Army to send a large force to the Mohave Valley in 1859 to establish a fort to protect a trade route through the area. The Mojaves were forced to give up part of their ancestral homeland for this fort, which had a devastating effect on them and marked the end of their existence as a separate nation.

The years 1859 to 1883 were characterized by unemployment, epidemics, starvation, and a gradual decline in agriculture. Table 1 gives population estimates. Note the rapid decline in population in the last half of the nineteenth century. Part of this can be attributed to the fact that about half of the tribe moved south to the Colorado River Reservation and were not included in estimates after 1854. But even doubling the 1905 figure produces a population of 1,712--which means the tribe lost more than half its members during this period.

In 1883 a railroad which ran through Needles was established. Many tribal members went to work for the railroad; others engaged in the tourist trade--selling artifacts to railroad travelers. In 1890 Fort Mohave was transferred to the Indian Service for a school. The Fort Mohave Indian Reservation was established with further additions in 1910 and 1911. The Indian School was operated for 41 years by the Bureau of Indian Affairs under the policy of educating Indians for citizenship by replacing their Indian culture with the predominant Anglo culture.

TABLE 1
POPULATION ESTIMATES FORT MOJAVE TRIBE

Year	(sources)	Population
1776	(4)	3,000[a]
1854	(4)	4,000[a]
1905	(3)	856
1959	(4)	435
1963	(4)	438
1975	(1)	632[b]
1977	(2)	660[b]

a/ Estimates for Mojave Tribe as a whole; after 1865 about half the tribe moved to the Colorado River Reservation.

b/ Figures given are for total Fort Mojave tribal enrollment. Population for reservation area: 1975-372; 1977-400.

Note: These figures come from several sources and can only be considered rough approximations.

Sources:

(1) Arizona Office of Economic Planning and Development; "Fort Mojave Indian Tribe Comprehensive Plan," 1975.

(2) Fort Mojave tribal records, 1977.

(3) Hrdlicka, Ales, "Physiological and Medical Observations," Bureau of American Ethnology Bulletin, 1908.

(4) Sherer, Loraine, The Clan System of the Fort Mojave Indians, 1965.

The Santa Fe Railroad gradually moved its operations from Needles to Barstow by 1942. As a result, employment opportunities for the Mojaves declined. Some dam construction work was provided by the Bureau of Reclamation, but these jobs ended when the dams were completed. Some of the Indians continued farming, but had difficulty competing with agribusiness firms. The flood of 1940 finally wiped out their farms. Since that time most of the Indians have been living in Needles, but a large number have left the reservation.

The above mentioned historical events have had a profound effect on the Mojave culture. Mojaves still living in the area are in a small town, urban environment. Most Mojaves are unemployed. Those employed are mostly wage workers for the Federal government or for businesses in Needles. A few work on farms recently established on the reservation. The Mojaves now have more material goods than before the white man came, but they feel poorer because they have less than the average Anglo in Needles.

The tribal structure is weaker than it was. Many of the enrolled tribal members no longer live on or near the reservation. Most of the children attend public schools in Needles, and are subject to socialization into a much broader culture than previously.

Mojave religion traditionally was not formalized in Anglo terms, a fact which has lead to difficulties. Many of the traditional songs and legends have been forgotten. The outward expression of dreams in community cultural activities has greatly diminished, and with it some of the closeness and unity of Mojave life has disappeared. However, on a personal level dreams are still an important force in their lives. (Grey, 1970; Sherer, 1965.)

The Mojaves still do not have a high regard for property, although their antimaterialistic attitude had diminished somewhat. In 1890 Indian agents tried to end the practice of cremations because they felt burning all the deceased's property destroyed the Mojaves' ambition to accumulate wealth. The Mojaves defied the agents and some are still practicing cremation today, although without the destruction of all personal property. There has been some reduction in the propensity to share material goods. (Devereux, 1961; Smith, 1966.)

Some Mojaves are accepting the Anglo work ethic. The Mojaves consider the lack of employment opportunities to be the most important problem facing the tribe today. They express a strong desire for vocational education. (AOEPD, 1975.) However, some Mojaves may still find long-term wage labor in Anglo terms unattractive.

The Indians spend more time within a close circle of family and friends than formerly, indicating the family structure may be stronger than previously. (Devereux, 1961.)

Marriage to nontribal members has become more common. On-reservation Indians establish relationships with many nontribal members in the Needles public school system. Off-reservation Mojaves have an even greater opportunity to establish such relationships. One result of this changing marriage pattern is a partial breakdown of the clan structure. (The clan system is patrilineal, i.e., children are members of their father's clan. When the father is not a member of the tribe, his children cannot be a member of any clan.) At present there are many non-clan members, whereas, in the past these cases were extremely rare. (Sherer, 1965.)

In a recent survey, many individuals expressed a concern over the loss of the Mojaves' language. The Indians indicated an interest in learning more about their ancestors and culture. (AOEPD, 1975.)

In sum, the Mojaves have gradually been losing touch with their old culture. In their day-to-day life they have adopted more Anglo ways although, in recent years, there seems to have been a revival of interest in the old culture.

EXISTING ENVIRONMENT

The November 3, 1977, enrollment of the Fort Mojave Tribe was 663 members. Most of the population lives in the California Village (Needles) and the Arizona Village (Mohave County). Thirty-nine percent of the members live off the reservation in 30 cities located in 12 states. Table 2 shows the population distribution of tribal members.

TABLE 2
RESERVATION POPULATION ENROLLED MEMBERS

	Population	Percent
California Village	181	27
Adjacent to Needles	96	15
Arizona Village	117	18
Mohave Valley	7	1
Total on reservation	401	61
Off-reservation	261	39
Total enrollment	662	100

Source: Fort Mojave Tribal Records. November 3, 1977.

Projections of future population by age group are shown in Table 3, and are based on total tribal enrollment, because it was felt that members would return if economic conditions improve. This table shows an additional 70 members by 1980 and an additional 300 members by 1990.

Lack of employment opportunities is considered one of the major problems facing the Mojave Indians. Labor force characteristics are shown in Table 4 for 1974 and 1975. The 31 percent unemployment rate reflects only those actively seeking jobs. Unemployment calculated as a percentage of the available labor force is 66 percent.

As stated previously, the major employer of the Mojaves is the Federal government through Public Works and Economic Development Act (EDA) funds. EDA funds have been used for land clearing in preparation for agricultural development. Other employers are local businesses in the Needles area and within Mojave Valley. Jobs are generally unskilled. Those Indians with skills generally have to leave the area to obtain appropriate employment.

TABLE 3
POPULATION PROJECTIONS BY AGE GROUP, FORT MOJAVE TRIBE 1980, 1985, 1990

Age	1980			1985			1990		
	Female	Male	Total	Female	Male	Total	Female	Male	Total
Less than 1	10	18	28	14	17	31	15	17	32
1-4	42	47	89	54	57	111	60	62	122
5-14	82	86	168	97	103	200	116	120	236
15-24	78	73	151	83	77	160	90	89	179
25-34	57	51	108	63	60	123	68	68	136
35-44	43	35	78	50	39	89	54	47	101
45-54	28	18	46	33	23	56	38	28	66
55-64	19	12	31	22	14	36	27	15	42
65 +	11	22	33	14	21	35	20	23	43
Total	370	362	732	430	411	841	488	469	957

Source: Arizona Office of Economic Planning and Development. Fort Mojave Indian Tribe Comprehensive Plan, 1975.

The Fort Mojave Tribe is in the process of developing its lands for agricultural production. The strongest motivation for this development is the desire to establish an economic base on the reservation. The tribe is also aware of the need to establish an undeniable claim to its right to withdraw 122,648 acre-feet of water from the Colorado River per year. Agricultural production would help make this claim stronger. The development is being accomplished primarily through leases to agribusiness firms because the tribe does not have the capital or the skills to farm all of its land without outside help. The largest leaseholders are the Colorado River Development Corporation (CRDC), Russel Brothers Farms, and Spirit Mountains Farms. The tribe itself has some of its own acreage under production. There are a total of 9,000 acres currently under production and another 12,000 to 15,000 acres planned for production in the near future. Alfalfa and cotton are the major crops produced. There are plans to put some acreage into vegetable crops within two years. At present the tribe's primary markets are in southern California and Phoenix, Arizona.

TABLE 4
COMMUNITY AND AREA LABOR CHARACTERISTICS
FORT MOJAVE

Characteristic	1975	1974
Total resident Indian population	632	586
Within the Reservation	307	287
Adjacent to the Reservation	320	299
Residents under 16 included in total	229	214
Resident Indian population - working age (16 and over)	225	210
16-24	85	80
25-34	40	38
35-44	35	33
45-64	41	39
65 and over		
Not in labor force - 16 and over	60	56
Students	10	10
Men/disabled, retired, etc.	20	19
Women/disabled, retired, etc.	15	14
Women/with no child care substitutes	14	13
Available labor force	165	154
Employed total	55	52
Permanent	40	38
Temporary	15	14
Unemployed	109	102
Unemployed, actively seeking work	51	48
Unemployed rate (percent)	31	47

Sources: Bureau of Indian Affairs, "Report of Labor Force," 1974 and 1975.

Fort Mojave Indian Community, Fort Mojave Reservation, "Affirmative Action Program for Equal Employment Opportunity," June 17, 1976, revised July 30, 1976.

All of the leases have a provision pertaining to the employment of tribal members. The following section of the CRDC lease is an example:

> EMPLOYMENT OF INDIAN LABOR. Leasee and any subleasee, assignee, or other successors in interest, shall employ available Fort Mojave Indian labor in all positions for which they are qualified, including truck drivers.

Many tribal members were employed in clearing the land, but only 10 are presently employed in farming the land. The Bureau of Indian Affairs (BIA) expects this will increase to 30 to 40 positions within two years.

All of the leases, except the CRDC lease, are for a 25-year term. After this period the tribe will own the land and any permanent capital improvements that the lessees have made on it. The tribe may lease these lands again, but it is expected tribal members will have obtained the skills necessary to operate these farms by that time.

The CRDC lease, which started in May 1967, is for a 99-year term. This is the maximum allowable time period for a lease on Indian lands. This particular lease is for this long-time period because the land is intended for use as a resort development. Developers of these operations would not have been attracted to a shorter lease because it often takes a long time to recover costs and to start making reasonable returns to their investment.

The CRDC lease is for approximately 13,000 acres on the northern part of the reservation, including sections within California, Arizona, and Nevada. This area is considered suitable for resort development because it is visually attractive, easily built upon, and because gambling may be approved for the section in Nevada.

Income to the Fort Mojave Tribe from the CRDC lease is calculated as the minimum annual rental fee, or a return from gross receipts generated on leased land, whichever is greater. In the latter case, the tribe would receive a varying percentage of gross receipts of businesses, depending on the type of operation. The leased land can be used for a variety of resort, residential, and industrial uses, and for reasonable compatible interim uses. The tribe receives the largest percentage return for residential lot rentals.

The lessee is required to install $28.5 million in capital improvements on the leased land within 25 years. If the lessee fails to comply with this provision the lease would be revoked; the land and any permanent improvements would become tribal property.

At present the lessee is developing the area into agricultural production under the interim compatible use provision. Crops have been planted on the southern part of the lease in California and Arizona. This development will move north, and by early 1979 the Nevada section should be in production.

CRDC is waiting for the outcome of the tribe's efforts to have gambling approved on the Nevada portion of the reservation before starting resort development. If gambling is approved, CRDC will move quickly to establish a hotel-casino on the Nevada section. Once this phase is completed, the corporation would gradually develop a resort-residential community. (Stephenson, 1977.) CRDC's plans are unknown if gambling is not approved, but it is assumed they would invest the $28.5 million in a resort development rather than lose the lease and its agricultural improvements.

The lessee is in the process of developing a master plan for its developments. The plan is not yet available, but the lessee says that the plan will be similar to that formulated by the Ogden Corporation, former developers of the lease. This plan included residential lots on 62 percent of the developed acres. The rest of the acreage was divided among recreation (marinas, golf courses, lakes), commercial and institutional uses (motels, restaurants, schools, churches, etc.), parks, and hotel-casinos. An eventual population of 31,300 was expected. Table 5 includes more specific data. The present developers would probably add an industrial park and include some continued agricultural production in their plan. (Stephenson, 1977.)

TABLE 5
GENERAL PLAN FOR DEVELOPMENT OF FORT MOJAVE INDIAN RESERVATION
BY THE OGDEN CORPORATION

	Residential	Commercial and institutional	Recreation	Parks	Hotel-casino	Total
Acres	3,785	545	995	471	332	6,128
Percent of total	62	9	16	8	5	100
Units	10,252					

Estimated resident population: 31,300. Total leases acres: 11,000. (Data not available for non-residential units.)

Source: Derived from Bryant, Tehle and Associates, 1969.

CRDC would probably handle residential lot leasing in the same manner as developers of the Big River subdivision on the Colorado River Indian Reservation. Lessees pay an initial price of $3,000 to cover their share of infrastructure costs, plus an annual rental fee. (Infrastructure is the set of supporting systems and facilities, such as transportation, medical service, and fire, protection that supports an area's social and economic systems.) Some commercial facilities (particularly the hotel-casinos) would most likely be developed by sublessees. CRDC has been in contact with some major gaming corporations from Las Vegas in connection with such arrangements. (BLM, 1977; Stephenson, 1977.)

In addition to the CRDC lease a 50-unit, low-cost housing project is expected to provide new employment opportunities. Although these will be short-term jobs, it is hoped that experience gained can qualify the Mojaves for jobs in the construction industry. (BLM, 1977.)

Personal income of tribal members is derived from wage employment and transfer payments. A current Bureau of Indian Affairs (BIA) estimate of personal income is shown in Table 6. Mean family income is below $5,500, compared with a mean family income of $15,000 in Clark County, Nevada; $12,000 in Mohave County, Arizona; and $13,000 in San Bernardino County, California. (Estimates derived from "1976 Survey of Buying Power," Sales and Marketing Management Vol. 117, No. 2, July 26, 1976.)

TABLE 6
FAMILY INCOME FOR FORT MOJAVE INDIANS
ON THE RESERVATION

Number of families	Income category (dollars)
40	500- 5,500
30	5,500-10,000
5	10,000 plus

Source: Bureau of Indian Affairs, 1977.

Housing on the reservation is classified as substandard. There are 58 homes in the California Village and 48 homes in the Arizona Village. Ten of these homes are unoccupied because of their deteriorated condition. The Department of Housing and Urban Development (HUD) has approved 50 units of Conventional Mutual Help Housing to be constructed on purchased land adjacent to the California Village. Ground has already been cleared for this project. A tribal housing authority will guarantee the loans and assume responsibility for maintenance of the homes. This project will help bring some of the housing up to standard for the existing residences of the California Village. Because of the strigent rules on income and the requirement of a backup list of additional qualified persons interested in obtaining housing, the project will not fulfill the entire demand for housing. The BIA will request HUD to fund another 50-unit project on the Arizona side in the near future. Lack of adequate housing is a major deterrent to off-reservation Mojaves returning.

Mojave children attend local public schools in Needles, California, and in Arizona. There are a large number of high school dropouts, probably because the students see little incentive to finish high school because of the lack of employment opportunities. (James, 1977.) Tribal officials realize this trend must be reversed if the Mojaves are to gain any advantage from development in the area. The Mojaves are especially interested in encouraging students to go into agriculture and accounting.

Health service facilities available to the Mojaves include the Public Health Service (PHS) Indian Hospital at Parker, the PHS Indian Health Center at Peach Springs, PHS Clinic in Supai, and the PHS Indian School Health Center at Riverside. A weekly health clinic is held at Needles in the tribal facilities. Needles also has a hospital emergency room and inpatient facilities, if needed.

The tribe currently has approval to build a nursing home for tribal elders with Economic Development Administration funds. Currently any patients needing extended care are transferred to Parker, Arizona. The new facility will allow the patients and families to maintain closer ties. Major health problems are alcoholism, diabetes mellitus, and respiratory disease. (BIA, 1977.)

Police and fire protection in Needles and the California Village are provided by the City of Needles. Four tribal policemen provide protection on the Arizona and Nevada portions of the Reservation. The tribal policemen are deputized by the Mohave County Sheriff's Department. An informal agreement exists between these groups to provide mutual assistance. (AOEPD, 1975.) A tribal court has recently been established. Prior to establishment of the court, law breakers had to be taken to Kingman, Arizona, for sentencing and incarceration.

FUTURE ENVIRONMENT WITHOUT THE PROPOSED ACTION

The Fort Mojave Tribe is located in an area that has shown accelerated growth in the last decade. Mohave County, Arizona's population increased dramatically between 1960 and 1970, from 7,700 to 25,857, a rise of 236 percent. Clark County, Nevada, increases were almost as spectacular going from 127,016 to 273,288, an increase of 115 percent, San Bernardino County grew the least, with the 1960 to 1970 period showing an increase of 33 percent. Table 7 shows regional and local population projections for these areas.

Of more interest than the overall population increase are the kinds of developments occurring in this area. One of the major factors in Mohave County's population growth is Lake Havasu City, a new town built by McCulloch Properties, Inc. There was virtually no development in Lake Havasu City until 1964. The population of the Lake Havasu City area was 5,185 in the 1970 census and 10,024 in the 1974 census. Lake Havasu City is similar to the development discussed in the proposed action.

Mohave Valley, the area of Arizona which would be most impacted by the proposed action, had a relatively slow growing population, located mostly in Bullhead City until the mid-1960s. The 1970 census reported the population of Mohave Valley at 5,350; the 1974 census, at 7,674.

The Needles, California, area declined in population from 4,307 in 1970 to 3,815 in 1975. Projections for this area show moderate increases in population through the study period.

Growth in the Laughlin area of Nevada has been rapid. Starting from a small base of 448 in 1970, it had increased 50 percent by 1973. A new condominium development has recently added another 230 units which has substantially increased population.

Growth, both in new cities and in scattered residential developments, would continue to occur in the area. Growth has been generated primarily by recreation opportunities and by the mild climate.

Employment opportunities have remained limited. Major employers in the immediate impact area are the Mohave Generating Station, the two casinos located in Laughlin, and the marinas scattered throughout the area. Employment also exists at the various support industries, such as gas stations and restaurants.

With population growth in the area, employment opportunities would increase. It is questionable whether the Mojaves can benefit from general growth of this kind. The Chemehuevi Tribe has a reservation adjacent to Lake Havasu City. The development of the city has had little effect on the tribe. The purchase of the Havasu Landing Resort by the tribe resulted in employment of about 20 tribal members. Other interaction has remained minimal. The Mojaves, however, have adapted to employment opportunities with the railroad at Needles in the past, and may be better prepared to capture some of the opportunities now occurring.

TABLE 7
REGIONAL AND LOCAL POPULATION PROJECTIONS

	1970	1974	1975	1980	1985	1990	2000
Needles Area[a/]	4,307	---	3,815	3,901	4,162	4,454	4,800
San Bernardino County[a/]	---	---	696,064	781,640	832,325	881,789	961,600
Mohave Valley[b/]	5,350	7,679	---	10,036	---	13,696	16,300
Mohave County[b/]	25,857	35,714	---	46,900	---	64,000	76,200
Laughlin Area[c/]	448	687	---	---	5,000	---	23,000
Clark County[d/]	273,288	---	332,500	404,533	459,543	519,271	605,900

Source:

a/ San Bernardino County Planning Department. "1977 Estimate of Population and Housing: Population Projections to 1995 by Census Tract and Planning District," 1977.

b/ Mohave County Planning and Zoning Commission. "General Development Plan, Mohave County Arizona," 1976.

c/ Clark County Regional Planning Council statement quoted in Arizona Office of Economic Planning and Development, Fort Mohave Indian Tribe Comprehensive Plan, 1975.

d/ Bureau of Business and Economic Research, University of Nevada, Reno. "Nevada Population Projections, By County for Selected Years 1975-2000," 1977.

Plans currently exist for a major recreational-residential development on the Fort Mojave Reservation. All development on reservation land has a monetary return to the tribe figured as a percentage of gross receipts. Currently, return from leases goes into the tribal budget, which in turn pays the salary of several tribal members who are employed by the tribe. The BIA has projected that tribal income, including revenue from leases, would be $500,000 by 1985. (BIA, 1977.) The Mojave Tribal Council believes this will be large enough to permit a direct distribution of a portion of this to tribal members. This would be made on a per capita basis regardless of residence. A full discussion of the impacts of the alternative proposals is contained in the following section.

New employment opportunities should exist for the Mojaves through the agricultural development which is proceeding full implementation of the leases and through Economic Development Administration programs.

Improved income levels should occur in the future from increased employment opportunities and income generated by the CRDC lease.

Social conditions would continue to improve in the future. Housing would improve with the completion of the Housing and Urban Development projects. Increased job opportunities would allow some off-reservation Mojaves to return. The increased opportunities would also allow some Mojaves who normally would have left the reservation to remain. The continuity of residence should help strengthen the Mojave cultural ties.

Working against this is the fact that accelerated population expansion and the increased interaction brought about by this expansion would tend to erode traditional Mojave culture. The large population influx would also weaken the rural character and values of the area.

Population growth in the area may create negative impacts if the growth causes the disruption of any geological features that were important in Mojave legends.

THE ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

In this section an analysis of the alternative with the greatest impact (i. e., the "worst case" condition) on the Fort Mohave Reservation will be presented in detail. The other alternatives have similar impacts but to a lesser degree; only a brief analysis of those alternative impacts will be presented.

Alternative B, the Beaumont proposal, and Alternative E, sale to private interests, would have the greatest impacts. More data are available on Alternative B, and there is no legislative authority under the current Act for Alternative E; therefore, the following analysis examines the impacts of Alternative B.

The impact area has been changing rapidly and would continue to do so without Alternative B. The major impacts of the alternative would involve increases in the rates of change already occurring.

The Colorado River Development Corporation (CRDC) has indicated it may scrap its plans to develop a resort-residential community on the leased land if a development such as Alternative B goes in on adjacent land. (BLM, 1977.) This would violate the lease agreement, which means the land and improvements would become tribal property, and the tribe would lose all income from the lease. By the time this occurs, the Indians may have the skills necessary to operate the agricultural developments that have been, and would have been, installed on the leased land. This would partially offset the loss of lease income, but the overall effect of less than full development would be a decrease in tribal income.

The tribe may lease the land to another developer. The impacts of this possibility depend on the terms of the lease, which cannot be estimated.

The following analysis will examine the impacts of implementation of the alternative if CRDC continues with its plans to develop a resort-residential community.

The main attractions to visitors in the area are water-based recreational activities, such as fishing, boating, and water skiing. The amount of this kind of activity is limited by the size of the Colorado River in the impact area. Alternative B and the CRDC plan both involve the construction of marinas as an integral part of their developments. The Nevada Riviera development plan, which involves an area two miles north of the proposed land sale area, also includes marina construction. At the present time there are marinas of varying sizes in the areas at Holliday Shores, Willow Valley, Riviera Estates, River Bend, Five Mile Landing, Catfish Paradise, and Burmuda City.

The CRDC marina would face intense competition without the alternative, but even greater competition with it. CRDC would be unable to rent as many boat slips if the alternative is implemented. The level of activity of the industries which would depend on the marina (gas stations, restaurants, boat supply stores, bait shops, etc.) would decrease. This would have a negative impact on tribal income, as the tribe's return on gross receipts from marina and marina-related business would decrease.

Implementation of Alternative B would compete with CRDC development for residential lot income. Both developments would be designed to appeal to retirees and persons interested in second homes associated with recreational activities. There is also expected to be a fairly large market in both of the housing developments for workers in industries caused by the developments. The main industrial sectors would be tourist-related service, residential-related service, and light manufacturing in the industrial parks planned for both developments. If these industries become established there should be a large market for this type of housing.

Population projections indicate by the year 2000 there will be a population increase of approximately 32,000 persons in the area. At 2.7 persons per lot, this translates into a demand for 11,851 lots for first home residential purposes. There would also be a demand for lots to be used as second homes for recreation. In 1970, approximately 26 percent of the lots with house units were used for this purpose. If this same distribution takes place in the year 2000, there will be a demand for 3,081 lots for second homes. This yields a total demand of 15,000 lots for first and second homes. At present there are approximately 20,000 undeveloped residential lots available in the area. If projected development plans are implemented, there could be an additional 28,000 lots available by the year 2000. This yields a total of about 48,000 residential lots. Subtracting from this figure the demand for lots for first and second homes leaves an apparent oversupply of about 33,000 lots; however, there would be an additional demand for lots for investment purposes. Rational investors would not purchase residential lots in an area if they do not expect its population to increase; therefore, investment demand is based to a large extent on expected population. There are no population projections beyond the year 2000, but even if investors expect the area to continue growth by the same yearly amount for the 25 years after the year 2000, as for the 25 years before, there would still be a large oversupply of lots. Any area with a large oversupply of residential lots can expect intense competition between developers for residential lot sales.

CRDC would be at a competitive disadvantage to the developers of Alternative B, because CRDC can only offer subleases which would terminate in 2066. Alternative B developers would be able to offer lots for sale or lease. Given a choice, most people prefer to own their own home rather than lease it. (This trend is evident in the impact area. In 1970 only 15 percent of the housing units in Mohave Valley were rentals or leases.) If similar market characteristics continue, the CRDC would have to offer low lease rates to attract customers away from the sales market. The Big River subdivision on the Colorado River Reservation has leased only 20 percent of its lots in its 10 years of operation. There are some major differences between this subdivision and the CRDC proposal, but it does illustrate the possibility of limited demand for leased lots.

If the proposal is implemented, the CRDC would not be able to lease as many lots and the annual per lot rental fee would be lower. This would have a major negative impact on tribal income because the lease agreement with CRDC gives the tribe its largest percentage return on gross receipts from residential leases. A decrease in the number of residential lots leased would result in a decline in the demand for residential services (grocery stores, plumbers, beauty parlors, etc.). This would also have a negative impact on tribal income as the return on gross receipts from business in this industry would be less.

If the proposal is implemented and the developers cooperate with CRDC in the construction of community infrastructures (sewage systems, transportation systems, water systems, gas and electricity systems, school systems, etc.), it may have some positive impacts on tribal income. The cost per unit of infrastructure of a community decreases as population increases until population reaches a level between 100,000 and 300,000. (Hirsh, 1968.) If the developers of the Beaumont proposal and CRDC shared infrastructures the size of the population served by these infrastructures would be closer to this level and their costs per unit would be less.

The decline in cost per unit itself would not increase tribal income since tribal income comes from a return on gross receipts. However, the decline in per unit costs would make CRDC's business more profitable, so they would be more likely to invest additional funds in the development. If this additional investment produced additional gross receipts, then tribal incomes would increase.

The following analysis of the hotel-casino industry is based on two main assumptions: 1) gambling will be legalized on the reservation; 2) a hotel-casino will be constructed on the CRDC lease. The first assumption is subject to unknown political factors. The second is subject to investment decisions of the developers. CRDC has indicated it would probably try to sublease part of its lease to another developer for hotel-casino operations. If this developer is given a choice between building a hotel-casino on land that he owns or on a sublease which would state that his hotel-casino would eventually become the property of the Fort Mojave Tribe, he would probably choose development on land he owns.

Alternative B, if implemented, may have some positive impacts on tribal returns on gross receipts from hotel-casino operations if gambling is legalized on the reservation. An important trait which distinguishes the hotel-casino industry is that it exhibits agglomerative characteristics. That is, hotel-casinos tend to be clustered in a relatively small area. It is advantageous for a hotel-casino to be located near other hotel-casinos because consumers show a preference for areas with a large number of hotel-casinos. The impact area cannot support an infinite number of hotel-casinos. There is some point where the above mentioned complimentary effects are replaced by competitive effects, but the hotel-casinos in the impact area at Laughlin are well within the range where complimentary effects are predominant. The managers of those hotel-casinos say they would welcome additional hotel-casinos in the area. (Bingham and Walla, 1977.) The implementation of Alternative B should make the area more attractive to industry customers. The hotel-casinos and those businesses which are closely related to the hotel-casino industry should also have larger gross receipts. This increase in gross receipts means there would be a corresponding increase in the tribe's return on gross receipts from these industries.

If there is no coordination or cooperation between the developers of Alternative B and the CRDC, both developments would suffer. For example, one developer could establish an industrial park adjacent to the other's residential area. This would decrease the demand for lots in the residential development. This kind of non-coordination could easily lead to rapid development of slum areas, which would be detrimental to the entire area.

The implementation of Alternative B would cause an acceleration in the rate of population increases in the impact area. This increase in population should result in an increase in tribal income from agricultural leases because the demand for agricultural products such as the proposed vegetable crops would increase. The tribe's return on gross receipts from agriculture on all of its leases would increase. The tribe's own farming operation would also become more profitable.

The overall impact of the implementation of Alternative B on Fort Mojave tribal income would be negative. The negative impacts in the residential lot and water-based recreation sectors would far outweigh the positive impacts that may occur in the hotel-casino industry, the agricultural industry, and through cooperative infrastructure developments.

The impact on employment of tribal members is unknown. There would be a decline in total employment within the CRDC development. While Mojaves are protected by the Indian hiring clause in the lease agreement, the effectiveness of this clause is questionable. For example, CRDC has 20 employees working on its agricultural developments, but none are tribe members. Lower tribal income would mean fewer employment opportunities in tribal operations. However, the implementation of the alternative would create an increase in employment opportunities in the area as a whole. The overall impact on tribal employment depends on how well the Mojaves can exploit these off-reservation employment opportunities. They were able to exploit such opportunities in the past when Needles was an important railroading center. Whether they can do as well if Alternative B is implemented is questionable.

The Chemehuevi Tribe, whose reservation is across from Lake Havasu City, was unable to get even one tribal member employed in that development.

Social and cultural values could be impacted if development occurs as delineated in Alterative B. However, these impacts may not be much greater than those already described in the "Future Environment Without the Proposed Action" section of this Appendix.

Accelerated population growth would occur with or without the proposed developments. The rate of change would be greater should development occur, which could lead to more interaction between the Mojaves and the Anglos.

To the extent that employment opportunities are less, more Mojaves may have to work and live off the Reservation. This would lead to a weakening of family and cultural ties. The Tribe could become more dependent on outside support such as welfare should development such as Alternative B occur. (The Mojaves have been decreasing such dependency, but the rate of decrease would be slower if development occurs. The Mojaves view dependency on the Federal government as undesirable, and would like to become less dependent.)

Accelerated population growth increases the likelihood of disturbance of the area's geologic features that were prominent in Mojave legend.

The proposed development might mean an increase in vandalism on the adjacent Indian lands. To fully police these lands the Mojaves would have to expand their current tribal police force. This impact would be minimized if a cooperative agreement to police reservation lands adjacent to the development could be reached prior to the start of development. Cooperative agreements currently exist between the Mojaves and various sheriff's departments.

The level of health and educational services should be unaffected by the proposed developments. Education would be provided under the Nevada school system, which is independent from the school system in which the Mojaves are enrolled. Mojaves generally use Bureau of Indian Affairs health facilities, which are independent from those that would be used by residents of any proposed development.

The following section consists of a brief analysis of the other alternatives discussed in the Final Environmental Statement.

Alternative A (the Eisner-Stewart proposal) with less intensive development would have the same impacts as Alternative B, but to a smaller extent.

Alternative C (retain the floodplain in public ownership) would have the same impacts as Alternative B, but to a smaller extent. There would be less competition in the marina industry.

Alternative D (no action) would have no impact.

Alternative E (sale to private interests) would have the same impact as Alternative B except for an increase in the possibility of noncooperation. (However, there is no authority for implementation of Alternative E.)

Alternative F (development as a public recreation area), if it is developed attractively and in cooperation with the CRDC, would have positive impacts in all sectors.

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APPENDIX G

COMMENT LETTERS

Note: Only those letters which contained substantive comments on the adequacy of the Draft Supplement are included in Appendix G. Fourteen letters were received which dealt with the same general subject but did not comment on the adequacy of the supplement. Letter No. 40 is included here as a representative example of these letters.

LIST OF COMMENT LETTERS

001	Nevada Outdoor Recreation Association, Inc.
002	Mr. J. R. Ray Alcorn
003	Nevada State Parks System (1)
004	Ms. Mary DeDecker
005	Mr. Tom Heindel
006	National Park Service
007	BLM, Utah State Office
008	BLM, Idaho State Office
009	State of Nevada, Division of Colorado River Resources
010	Fish and Wildlife Service
011	Ms. Tina Nappe
012	California Native Plant Society
013	Natural Resources Defense Council, Inc.
014	Mr. Richard J. Vogl (1)
015	University of Nevada, Las Vegas, Department of Anthropology
016	Mr. Ike C. Eastvold (California Desert Archaeology Committee)
017	Mrs. Martha McLean
018	Nevada State Parks System (2)
019	Nevada State Clearinghouse
019A	Division of Colorado River Resources
019B	Department of Fish and Game
020	Department of the Army, Corps of Engineers
021	Mr. Richard J. Vogl (2)
022	Bureau of Reclamation
023	Mr. Scott Bailey
024	Mr. Richard Spotts
025	Ms. Elizabeth Bingham
026	Mr. P. C. DeBaryshe
027	Ms. Erica C. Garcia
028	Ms. Lonnie Carden
029	National Wildlife Federation
030	Advisory Council on Historic Preservation
031	Mr. Bill Vincent (Editor, The Nevadan)
032	Frontier Girl Scout Council (Mrs. Mark Line)
033	Ms. Margurite Cristoph
034	Ms. Joanne L. Campbell
035	Mr. Robert Stijn
036	Mr. Henry Peck
037	Ms. Sherry L. Roberts
038	Ms. Yvonne E. Carter
039	Mr. Siegfried Bing
040	Mr. and Mrs. J. N. Lally
041	Mr. Joe Newman
042	Ms. Maggie L. McShan
043	Mr. Jerry Kein
044	Fort Mojave Indian Tribe
045	Bureau of Indian Affairs

001

NATIONAL PUBLIC LANDS TASK FORCE

NEVADA OUTDOOR RECREATION ASSOCIATION, INC.

February 16, 1977

HONORARY LIFE MEMBERS

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Carson City, Nevada
Alvin McLane
Reno, Nevada
Anthony O. Rosso
Arvada, Colorado
Darwin Lambert
Luray, Virginia
Sonia De Hart
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Sparks, Nevada
M. Burrell Bybee
Ely, Nevada
B. Riley McClelland
Missoula, Montana
Rex and Muriel Lund
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IN MEMORIAM

George Kell
Sparks, Nevada
George Lund
Unionville, Nevada
Charles Rago
Sparks, Nevada
James G. Hulse, Sr.
Pioche, Nevada

P.O. Box 1245
Carson City, Nevada 89701

Ed Rowland
State Director
Nevada State Office
U.S. Bureau of Land Management
Room 3008, Federal Bldg.
300 Booth Street
Reno, Nevada 89509

subject: Fort Mohave lands and
new Yuma Clapper Rail
sightings

pending Ciuliani report
on rare invertebrates in
Nevada BLM dune areas

Dear Ed:

Firstly, this letter is to alert you and the Las Vegas District Office to new information concerning sightings of the Yuma clapper rail in and adjacent to Colorado River drainage in southern Nevada.

We now have three expert witnesses who have seen this rare and endangered species in the Fort Mohave tract and as far north as Las Vegas Wash. Eight(8) of these unique shorebirds were seen at one time in Las Vegas wash by the son of J.R. "Ray" Alcorn** (Fallon, Nevada) as well as sightings made by Mr. Alcorn himself, which according to him date back to 1959. Still another sighting was made during the winter of 1971-72 by Forest Reynolds(Blythe, California) a field warden of the Calif. Fish & Game Dept. It was Mr. Reynold's photograph(a fact that we had to keep confidential till now), taken in 1971 in the marsh area of the 9,000-acre Fort Mohave tract, which we included in our statement for the draft EIS on this matter. We feel these new sightings establishes, without a shed of doubt, the need to recognize all Colorado River public lands south of Las Vegas as critical habitat for this officially recognized endangered species. We therefore submit that any transfer of the Fort Mohave lands to the state—which refuses to recognize any environmental safeguards; indeed insists on development of such critical habitat lands—must be rejected, under terms of the Endangered Species Act. We wish this letter to be made a part of the continuing record for Fort Mohave lands proceedings.

Mr. Derham Ciuliani, a recognized expert on invertebrate species, from Big Pine, California, was recently awarded a grant to do studies of Nevada's major dune areas(on BLM lands). Mr. Ciuliani has submitted the first part of a significant report that shows these dunes(Big Dune, Hawthorne Dunes, Crescent Dunes, Winnemucca Dunes, etc.) have resident populations of totally indigenous and extemely rare invertebrate species. Mr. Ciuliani's work is widely recognized in California—including such agencies as the Bishop BLM Resource Area, the California Academy of Sciences and the University of California. We had expected to submit to your office and the appropriate BLM area and district offices a copy of this

—continued—

note; Mr. Alcorn was recently retired as a wildlife officer of the U.S. Fish & Wildlife Service.

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E. I. Rowland/BLM state director(continued) page two

first part of his report. However, yesterday(Feb. 15) Mr. Ciuliani visited with me at my Carson City office and verbally informed me that he has made additional findings that extend to Sand Mountain, near Fallon as well. We wish to make it known now, however—for the record—that we can expect to formally publish, in the near future, a report which we feel will have major implications under the Endangered Species Act for such areas as Big Dune(Amargosa Desert), Hawthorne dunes (near Walker Lake), Winnemucca Dunes(west of hwy. #95), Crescent Dunes (near Tonopah) and Sand Mountain(40 Mile Desert).

Respectfully submitted,
Charles S. Watson Jr.
Charles S. Watson, Jr.
Director

cc: Derham Ciuliani, Big Pine, Calif.
John Boylee, BLM, Las Vegas District
Cene Nodine, BLM, Battle Mtn. District
L. Paul Applegate, BLM, Carson City Dist.
Chester Conard, BLM, Winnemucca District

002

6495 Power Line Road
Fallon, Nevada. 89406
March 15, 1977.

MR Edgar Rowland, Director
BUR. Land Mgmt. Room 3008
300 Booth St., Reno, Nev. 89509

Dear MR. Rowland. attn. Roger McCormick

I understand that there is some question about the status of the Clapper Rail in Nevada. On Sept. 6, 1959 Mr. Al Jonez and Mr. Albert Alcorn reported seeing 8 of these rails at the Las Vegas sewage disposal drain ditch. Both of these men worked for the Nev. Fish & Game and are trained wildlife biologists. On another date, Sept. 19, 1959, Albert Alcorn reported seeing a lone clapper rail at this same location in Clark County, Nevada. I suggest that a few of these birds may be found all along the Colorado River, in suitable habitat, as far north as Overton. I realize that there are few records of this rail in this area, but they are often present in an area without people knowing about it. The habitat that is suitable for these birds in this area is very limited and I hope it can be maintained.

Also, the habitat for the Sigmadon cotton rat is very limited ~~in~~ along the Colorado river in this area. At present my secretary is on extended leave and I hope you can read my printing.

Sincerely
J.R. Ray Alcorn

c.c. C.S. Watson

003

MIKE O'CALLAGHAN
Governor

NEVADA

NEVADA
STATE
PARK
SYSTEM

JOHN L. MEDER
Administrator

ROOM 221
NYE BUILDING
201 S. FALL STREET
CAPITOL COMPLEX
CARSON CITY,
NEVADA 89710
(702) 885-4384

In Reply Refer to
561-BLM

MAR 15 1977

Mr. E. I. Rowland
State Director (N-911)
Bureau of Land Management
Room 3008
Federal Building
300 Booth Street
Reno, Nevada 89509

Dear Mr. Rowland:

This office has reviewed the Draft Supplement to the Final Environmental Statement, Proposed Sale of Fort Mohave Lands, Nevada. We appreciate the opportunity to offer comment. Our comments will be confined to those portions of the Supplement which deal with cultural resources.

We concur with the recommendations of the Nevada Archaeological Survey that the Colorado River Council Contract for additional archaeological survey prior to sale or development of lands within the area of concern. The Bureau of Land Management has reiterated the recommendation on Page 13 of the draft as an affirmation of intent.

We do not see a similar Bureau of Land Management acknowledgement or affirmation of the recommendations made by the University of Nevada, Las Vegas, History Department and the Nevada State Historical Society, Reno, relative to known historic sites and mitigating measures against adverse affect. Perhaps the reproduction of the comments as incorporated in the draft was intended to serve this purpose, but we would prefer to read a more affirmative and direct declaration on the part of the Bureau of Land Management.

Our final comment is in the nature of a
future E.I.S. preparations dealing with
ation of eligibility of places to the Na

dministration: (702) 885-4384
Operation and Maintenance: (702) 885-4387
ning and Development: (702) 885-4370

a division of the Department of Conserv

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Mr. E. I. Rowland
Page 2

include provisions for consultation with this office; as per 36 CFR 800.4, Federal Register, Vol. 41, No. 28, February 10, 1976.

Again, thank you for the opportunity to comment.

Sincerely,

John Meder, Administrator
(State Historic Preservation Officer)

By: John Richardson, Assistant Administrator
(Alternate, State Historic Preservation Officer)

cc: Steve Robinson
Bruce Arkell

004

P. O. Box 506
Independence, Ca. 93526

March 17, 1977

Mr. Ed Rowland
Bureau of Land Management
Room 3008, Federal Building
300 Booth Street
Reno, Nevada 89509

Dear Mr. Rowland:

It has come to my attention that the Bureau of Land Management is being pressed to release land in the Fort Mohave area in the southern tip of Nevada. It is obvious that the objective is development on a large scale.

As one who is familiar with eastern California and Nevada, I strongly question the wisdom of allowing this land to be released from control of the Bureau of Land Management. That is a desert area, and the special natural values of desert lands are, at last, beginning to be appreciated. They may hold the key to our future existence as the population exceeds the conventional resources of today. If the BLM cannot resist pressures to release the land, we may be sure that no desirable restrictions on future use would ever be upheld.

That southern tip of Nevada is a fine example of the Sonoran Desert. It is Nevada's only site for the smoke tree (Dalea spinescens) and is thought to be the most northerly occurance of that species. That is of scientific significance. It indicates the possibility of unusual ecological values associated with it. We are learning, sometimes by disastrous means, that such clues must not be disregarded. No special habitat should be allowed to be destroyed or degraded, even though we may not know its full significance at this moment in time.

As for my credentials for expressing an opinion on botanical values, I have a fairly intimate knowledge of desert country and the plants which grow there. I live in Owens Valley, so am in close touch with the California Desert and the southern half of Nevada. It is a fascinating region. Because I do know the flora east of the Sierra Nevada so well, I am considered an authority on it. At the present time I am engaged in writing a flora of Owens Valley and its mountains, a tremendous undertaking describing over 1400 taxa. I have discovered one new genus, four new species, and a new variety. The genus, a desert shrub in the buckwheat family and discovered on BLM land, is Dedeckera eurekensis. Two of the genera are named

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for me, Lupinus dedeckerae and Trifolium dedeckerae. Under contract with the Bureau of Land Management, as part of the California Desert Planning Program, I will begin shortly on a plant inventory of the northern region of the desert.

The fact that tremendous amounts of money are being spent on desert study is evidence that it is considered extremely important. The first step toward its protection is recognition that unusual values do occur on the desert. Then the processes of study, planning, and management can follow in a reasonable manner. In these enlightened times, it would seem to me an irresponsible act to give up any unique parcel of public land. We who are working toward the protection of the California Desert would deeply resent any development along the state line which would result in serious impact in this state.

As a matter of human interest, which must not be disregarded, one has only to visit any western art exibit to see how much the smoke tree is appreciated. It is considered one of the most beautiful of desert plants. It ranks extremely high in aesthetic value.

This is written in the hope that the long range vision will outweigh the short-sighted "I-want-my-dollar-now" demands of today.

Respectfully,

Mary DeDecker

Mary DeDecker
Field Botanist

005

17 March, 1977
Box [illegible]
Big Pine, CA 93513

Mr. Edward Rowland
State Director, Bureau of Land Management
Room 3008, Federal Building
300 Booth St., Reno, Nevada 89509

Dear Mr. Rowland:

It has come to my attention that you have the authority to transfer 9,000 acres of land along the Colorado River, to the Commision on Colorado River Resources, and that such an action is being considered. I refer to the Mohave tract in extreme southern Nevada.

Such an action would undoubtedly lead to the ecological destruction of a habitat that is already rapidly dwindling wherever it is found.

While birding along the Colorado River, near Blythe, California, I discussed the occurrence of the Yuma Clapper Rail with two men from the California Department of Fish and Game. Both seemed very knowledgeable, and stated that these birds were found in the area under discussion. I would certainly hope that we would not trade, sell, give away or take any action that might affect this rare bird.

I can well imagine the pressure that you must be under at this time. The power of big business can be awesome. As more and more of our country is whittled away, what is left will become more and more important. This is especially true near large urban areas. 100 years from now, few people will remember that you or I ever lived. But if we work together to keep part of our country intact, that mey be more important than anything we could ever do during our short tenure.

Let the record show that we had the courage to stand up and be counted. And let it show that we voted our conscience.

I live in the Owens Valley and have taught field ornithology here and in Arizona for both the University of California at Los Angeles and the University of California at Riverside. I consider the Colorado River in general, and the area in question specifically, a very important link for many migratory species of birds, and also an important habitat on a year round basis, for many other birds.

Respectfully,

Tom Heindel

006

United States Department of the Interior
NATIONAL PARK SERVICE
LAKE MEAD NATIONAL RECREATION AREA
601 NEVADA HIGHWAY
BOULDER CITY, NEVADA 89005

IN REPLY REFER TO:
L7621

March 24, 1977

Mr. E. I. Rowland
State Director, Nevada State Office
Bureau of Land Management
Room 3008 Federal Building
300 Booth Street
Reno, Nevada 89509

Dear Mr. Rowland:

We have reviewed the Draft Supplement to the Final Environmental Statement for the Sale of Fort Mohave Lands to the State of Nevada and have no comment at this time.

Thank you for the opportunity to review this document.

Sincerely yours,

Jerry O. Wagers
Superintendent

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

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STATE OF NEVADA
DIVISION OF
COLORADO RIVER RESOURCES
P.O. Box 19090
LAS VEGAS, NEVADA 89119
TELEPHONE (702) 733-7755

MIKE O'CALLAGHAN
Governor

DONALD L. PAFF
Administrator

April 8, 1977

Mr. E. I. Rowland, State Director
U. S. Bureau of Land Management
Room 3008 Federal Building
300 Booth Street
Reno, Nevada 89502

Dear Mr. Rowland:

Your letter of March 9, 1977 transmitted to us two copies of the March 8, 1977 draft supplement to the Final Environmental Statement for the sale of Fort Mohave lands to the State of Nevada (INT FES 75-10). Also by your letter of March 10, you advised that 25 copies of the draft supplement had been forwarded to the Nevada State Clearinghouse and additional copies had been mailed to other members of the public.

We have reviewed the draft supplement and will be providing our comments to the Nevada State Clearinghouse for assembly and transmittal to you with other State agency comments.

With regard to the comments received, we request that all comments be included and addressed in the final supplement filed with the Council of Environmental Quality (CEQ). When this final supplement is transmitted to CEQ, we request that you provide this office four copies for our use and files.

In review of the schedule of actions required by the Secretary of Interior pursuant to the Further Amendment to Contract of Sale Between the United States and the State of Nevada signed by the Secretary of Interior on June 22, 1976 and Governor O'Callaghan on June 23, 1976, we request you provide us at the earliest possible date the schedule of actions to be taken and information you will provide the office of the Secretary of Interior relating to Secretarial actions not later than June 1, 1977, as required by the Amendment (Article VIII). In the development of the schedule of actions and information, we seek the fulfillment of the commitment by the Secretary's office that the State will be involved and will be consulted as to his determinations required under Article VIII prior to making such determination final.

As you are well aware the time available prior to June 1, 1977 is estremely limited and thus we urge your early response so that we may jointly accomplish the remaining activities in a timely fashion.

Sincerely,

Donald L. Paff

Donald L. Paff
Administrator

cc: Mr. Norman S. Hall, Director
Dept. of Conservation
Mr. Brian McKay, Deputy Attorney General

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UNITED STATES GOVERNMENT
Memorandum

FISH AND WILDLIFE SERVICE

TO : State Director (N-911), BLM,
Reno, NV

DATE: April 6, 1977

FROM : Field Supervisor, ES,
Laguna Niguel, CA

SUBJECT: Draft Supplement to the Final Environmental Statement for the Sale of Fort Mohave Lands to the State of Nevada (INT FES 75-10)

The subject draft has been forwarded to us for review and comment. These comments relate only to the adequacy of the draft supplement as a full disclosure document and in no way reflect the posture of the Service towards the land transfer.

We believe the draft supplement adequately discusses subjects which fall within our areas of expertise and jurisdiction.

We would like to take this opportunity to reiterate Service concerns regarding retention and preservation of the floodplain, especially the 2,700 acre area adjacent to the Colorado River. This area presently contains some valuable wildlife habitat, but more important, it provides enormous potential for wildlife enhancement. As indicated in earlier Service comments on the draft EIS, it appears that, of the alternatives offered, Alternative C will best protect the natural resource values in the project area.

We hope that these comments prove helpful in your preparation of final plans for this project.

Thank you for this opportunity to review and comment on the draft supplement.

James J McKevitt
James J. McKevitt

RVF:gr

cc: AM, Sacramento, CA
T. Harper, LE, Las Vegas, NV
ES (EC) Washington, DC
ES (EC) R.O., Portland, OR

CONSERVE AMERICA'S ENERGY

Save Energy and You Serve America!

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NAPPE

April 8, 1977

BLM(N-911)
Room 3008
Federal Building
300 Booth St.
Reno, 89509

Draft Supplement to Final Environmental STatement
on Sale of Fort Mohave Lands

The deadline for comments on the Fort Mohave Draft Supplement is coming. I do not have the time to review the original statement or the supplement. The concerns I address may have already been included. If so, I apologize.

The news release states that the supplement primarily pertains to wildlife aspects. The public interest also extends to public recreational use and the impact of water requiremements, air quality, sanitation, and energy consumption should the lands be transferred into state ownership.

Should the lands be purchased by Nevada, they will most probably go into private hands through the auspices of the Colorado River Commission. The Commission is pro-development and may reflect southern Nevada views about the use of land. Because southern Nevada has over half the state's population, it is certain that the balance of the state would have little say in the future of those lands.

Should the lands go into private ownership public recreation will be negligible at best and eventually nonexistent. Except for State Park lands, public access to water can be limited. Nevada state water law gives the public recreational use of surface water; yet at Lake Tahoe privately built docks have been built out into the Lake and the public prohibited access with no state intervention to stop it. The Lake Tahoe situation would easily be replicated at the Colorado River where big developers and wealthy private interests can afford river front land. The continuous exertions of these interests on government to extend development and thereby upgrade the value of their holdings are far more influential than those who can afford only occasional use of the beach and surface water.

I am also wondering if other states dependent on Co
water supplies have indicated any concern about the
and sewage treatment. Has Clark County agreed to sh
Colorado River allotment with any proposed developmen

3340 BERTHOUD • RENO, NEVADA 89503

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conversely, under Nevada Water Law, is there sufficient appreciation of the relationship between ground and surface water, so that if development depends on wells, Colorado River water is not being sucked out to supply the community.

What will be the industry to support the community? If residents commute to Las Vegas what effect will this have on air quality and energy consumption? I add the energy consumption aspect because I feel that eventually states will be responsible for reducing energy consumption. All of us throughout Nevada will depend on what others do. A major use of energy is transportation between work, home, and stores; this area will be the most difficult to reduce.

In conclusion, the turning over of lands to the State of Nevada has implications for other states and for the recreational minded public. Before I, as a Nevada resident as as part of the national public could properly consider the loss of national lands to state control and private interests these issues should be considered.

Most Sincerely,

Tina Nappe

Tina Nappe

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THE CALIFORNIA NATIVE PLANT SOCIETY

DEDICATED TO THE PRESERVATION OF CALIFORNIA NATIVE FLORA

June Latting, Ph. D.
Southern California Conservation Representative
320 Maravilla Drive
Riverside, California 92507

8 April 1977

Honorable Cecil D. Andrus
Secretary of the Interior
Office of the Secretary, Room 6151
U.S. Department of the Interior
Washington, D.C. 20240

Re: Final Environmental Statement (1-23-75) and Supplement N-911 (3-8-77) on Proposed Sale of Fort Mohave Lands, Nevada, involving transfer of 9,000 acres of national resource lands in Clark County, Nevada to the State of Nevada.

Dear Secretary Andrus:

The proposed transfer of BLM land to the State of Nevada referred to above has just come to our attention. We believe the 9,000 acres involved should remain in Federal ownership, preferably as a wildlife refuge or management area, for the reasons given below. We urge your consideration of these points in arriving at your decision concerning the disposition of this land.

1. These lands obviously have the qualities of prime wildlife refuge and should be considered for that designation. However, the wildlife and vegetation are dealt with in the Supplement, pages 3-6, in a very brief manner which is also reflected in Appendix A, Report on Endangered Species Act Compliance for Vegetation (page 15) and in Appendix C, Report on Endangered Species Act Compliance for Wildlife (page 23). Actual field work for plants was the 3-day period of June 8, 9 and 10, 1976, and for animals a 3-day period during the week of March 9-13, 1976, and an additional two searches for Yuma clapper rail on April 19-20 and May 26-27 of 1976, which were without success. We submit that such inspections did not cover an adequate time span and therefore were insufficient to establish a true inventory of the threatened or endangered species and of the flora and fauna present. In addition, a species listing in itself does not consider the various aspects and importance of composition and structure of the vegetation.

2. Appendix D of the Supplement, Cultural Resources Inventory, page 33(7), includes the following picture of the biota and features of importance:

> "This region is the only locale where smoke tree (Dalea spinosa) occurs in the State of Nevada (Bradley, 1966)". (Underlining added).

On page 33(8-11), the following is stated:

> "The fauna that inhabit this project area include fish, amphibians, reptiles, mammals and birds....the bird species found inhabit the area on both a year round and seasonal basis and it is a major migration stop for numerous species. 'Birds and waterfowl may be found primarily in the phreatophytic vegetation of the flood plain. Quail, hawks, vultures, mourning dove, owls and numerous water birds and shore birds utilize the dense vegetation along the river. The sloughs and back water area inside the river levee system provides limited habitat for ducks, waterfowl and shore birds. Several species of snakes, lizards, frogs, toads and even turtles inhabit the subject area (BLM Environmental Statement, 1975:49).' Mammals that frequent the area include shrews, jackrabbit, desert cottontail, Yuma antelope squirrel, valley pocket gopher, pack rat, many species of mice, coyote, desert kit fox, gray fox, badger, bobcat and bighorn sheep....In this area faunal population sizes are greater along the Colorado River in the flood plain and in the mountains rather than on the alluvial fan slopes. It should be noted that migration is probable between both environments by several species throughout the year."
>
> "In general, the alluvial fan area with the desert shrub vegetation, provides habitat primarily for a small population of nocturnal desert wildlife, which would include small rodents, lizards and insects. Because of the arid nature of the area, little wildlife is seen in daylight hours, with the exception of perhaps lizards. The flood plain provides more food, cover and water for wildlife habitat, thus producing a more varied population (BLM Environmental Statement 1975:49)."

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Honorable Cecil D. Andrus -2- April 8, 1977

The above indicates that a very careful and thorough study and complete inventory should be made of the very rich floral and faunal populations in this area.

3. Concerning flooding, the entire Fort Mohave lands area is subject to shallow sheet floods, in addition to 50-year or 100-year flooding (Supplement, page 4). This of course, while disastrous and expensive for developments, would be marvelously beneficial and advantageous for a wildlife refuge. We call your attention to the responsibility of heads of executive agencies as quoted in the Environmental Defense Fund letter of March 5, 1975 (Supplement, page 53):

> "....heads of the executive agencies shall provide leadership in encouraging a broad and unified effort to prevent uneconomic uses and development of the Nation's flood plains...."

4. Appendix D. of the Supplement also recommends that the historic sites be studied further to determine their significance; that certain prehistoric sites be photographed, extensively mapped and sampled and that searches be made to locate other possible prehistoric sites, pictographs and petroglyphs. It further states on page 43(75): "Without the recommended mitigation for the sites already recorded and historic and prehistoric surveys of the adjacent northeast and southwest quadrants of the second terrace and alluvial fan, no recommendation for clearance can be made to allow for the developments proposed in this area for the BLM Environmental Statement, 1975." (Underlining added).

In view of the above, we protest the transfer of this tract through the State of Nevada to the Colorado River Council and private interests for development of marinas, condominiums and other commercial activities. This land is the only portion of the Colorado River in Nevada not impounded by dams and one of only three

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Honorable Cecil D. Andrus -3- 8 April 1977

such riparian bottomlands still in existence along the entire lower Colorado River. We cannot overly stress the importance of retaining the natural attributes and resources of what remnants of undisturbed riparian lands are left to us.

We respectfully urge that these 9,000 acres remain in Federal ownership as a wildlife refuge or management area.

Yours very truly,

June Latting

June Latting, Ph. D.

cc: E. I. Rowland, State Director, BLM
Room 3008, Federal Bldg.
300 Booth Street
Reno, Nevada 89509

Roger McCormack, Asst. State Director, BLM
Room 3008, Federal Bldg.
300 Booth Street
Reno, Nevada 89509

Natural Resources Defense Council, Inc.
Attn. Johanna Wald
2345 Yale Street
Palo Alto, CA 94301

Environmental Defense Fund
2778 Durant Avenue
Berkeley, CA 94704

Dr. James Payne Smith, Jr., President
California Native Plant Society
193 13th Street
Arcata, CA 95521

Charles S. Watson, Jr., Director
National Public Lands Task Force
P.O. Box 1245
Carson City, Nevada 89701

013

Natural Resources Defense Council, Inc.
2345 YALE STREET
[redacted]
PALO ALTO, CALIFORNIA 94306
[redacted]
415 327-1080

Washington Office
917 15TH STREET, N.W.
WASHINGTON, D.C. 20005
202 737-5000

New York Office
15 WEST 44TH STREET
NEW YORK, N.Y. 10036
212 869-0150

April 8, 1977

Mr. E.I. Rowland
State Director
Nevada State Office
Bureau of Land Management
Federal Building
300 Booth Street
Reno, Nevada 89502

RE: Draft Supplement to the Final Environmental Statement/Proposed Sale of Fort Mohave Lands, Nevada

Dear Mr. Rowland:

This letter constitutes our comments on the above-referenced document. We appreciate the efforts made by the Bureau of Land Management (BLM) to ensure that the proposed transfer, if implemented, will not violate the Endangered Species Act of 1973. We have reviewed the "Endangered Species Compliance Reports" which are reproduced in the draft supplement. While we have not made a detailed examination of the adequacy of the studies performed by the authors of these reports, we are unaware of any evidence that the methodologies utilized were inadequate and we do not have any evidence independent of the final EIS that the proposed transfer is likely to jeopardize the continued existence of any of the identified protected species or to adversely impact any potential "critical" habitats.

While we do not take issue with the substance of the reports, we are concerned about the procedure followed by the Bureau in this instance. Accordingly, we wish to take this opportunity to comment on the inadequacies of the approach in the hope that, in future cases, the Bureau will comply with the procedural requirement imposed by Section 7

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as well as with its substantive mandates.

As our March 13, 1975 comments on the final environmental impact statement (EIS) on the transfer of the Fort Mohave Lands made clear, Section 7 imposes a non-discretionary obligation on all federal agencies to consult with, and obtain the assistance of, the Fish and Wildlife Service (F&WS) in any case in which a proposed action may reasonably be expected to result in adverse impacts to protected species or their habitats. The final statement on its face revealed that such impacts were likely to result if the proposed transfer were implemented. (See, e.g., pp. 100-101 of the Final EIS.) Yet, it failed to demonstrate that the BLM had complied with Section 7's consultation requirement. Under these circumstances, therefore, it was clear that the Bureau was required to formally request the initiation of consultation with the F&WS. (Cf. FWS, "Guidelines to Assist Federal Agencies in Complying with Section 7 of the Endangered Species Act of 1973" (April, 1976); Proposed Regulations for Interagency Cooperation Pursuant to Section 7 of the Endangered Species Act of 1973, 42 Fed. Reg. 4868 (Jan. 26, 1977).

Instead of requesting the assistance of the F&WS, however, the Bureau chose to conduct, on its own, additional studies of the Fort Mohave lands and their value for the identified endangered species. We submit that this approach was patently incorrect at the time it was undertaken. Section 7 mandates interagency consultation, not just further independent agency screening and analysis, whenever there is reason to believe that protected species or their habitats may be affected by a proposed action or program.

This is not an academic point. Interagency consultation is essential to the realization of the vital national goals of the Endangered Species Act as well as to compliance with the stringent prohibitions imposed by Section 7. (See, e.g., our comments on the final EIS, pp. 3-4.) Failure to consult may substantially hinder the realization of these goals.

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Accordingly, we hope that the BLM will not hesitate to initiate consultation with the Service[*] in appropriate cases in the future.

Finally, regardless of the findings of the compliance reports, we still believe that the Bureau of Land Management and the Secretary of the Interior should reject the proposed transfer and intensive development of the Fort Mohave lands. They constitute Nevada's only known example of the Sonoran Desert life zone and their development as proposed would eliminate this entire ecosystem, as well as produce other significant environmental impacts. Even assuming that no endangered species will be affected by this proposed action, the Fort Mohave lands constitute valuable riparian open space which should be preserved for the benefit of the general public.

Thank you in advance for your consideration of our views.

Sincerely yours,

Johanna H Wald
Johanna H. Wald

JHW:lr

cc: Mr. Lynn Greenwalt
Mr. Curt Burklund

---

[*] In this regard, we stress that, if any question as to the adequacy of the compliance reports is raised in comments on the draft supplement submitted by the F&WS, other agencies or qualified individuals, the Bureau must consult with the F&WS prior to the issuance of the final version and that the final document must contain the conclusions and recommendations of the Service.

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CALIFORNIA STATE UNIVERSITY • LOS ANGELES
5151 STATE UNIVERSITY DRIVE LOS ANGELES CALIFORNIA 90032

April 5, 1977

Mr. Roger McCormack
Assistant State Director
U.S. Department of Interior
Bureau of Land Management
Room 3008 Federal Building
300 Booth Street
Reno, Nevada 89502

Dear Mr. McCormack:

As per our telephone conversation of April 5, 1977 (11:00 AM), I intend to conduct a vegetational survey of the Fort Mohave Lands parcel. I understand that the due date for submission of materials and information regarding this proposed sale parcel is April 11, and I am requesting a 10-day extension. I was not informed of the need for such a survey until yesterday, April 4, when Mr. Charles Watson, Jr. presented me with a copy of the "Draft Supplement to the Final Environmental Statement." Upon examination of this document, I found the discussions of the various vegetation types present as to their compositions and relative values to be inadequate. As a result, I intend to conduct a survey of the parcel, and will submit my results to your office by April 20.

Thank you for assuring me that my forthcoming report will be allowed to be submitted and will be considered.

Sincerely,

Richard J. Vogl
Richard J. Vogl
Professor of Biology

RJV:er

THE CALIFORNIA

015

UNIVERSITY OF NEVADA, LAS VEGAS
4505 Maryland Parkway Las Vegas, Nevada 89154
Department of Anthropology
Ethnic Studies
(702) 739-3590

April 8, 1977

State Director (N-911)
Bureau of Land Management
Room 3008, Federal Building
300 Booth Street
Reno, Nevada 89509

Dear Sir:

Having reviewed the draft supplement to the Final Environmental Statement for the Sale of Fort Mohave Lands to the State of Nevada, I would question greatly the transfer of these 9,000 acres of of national resources lands in Clark County, Nevada to the State of Nevada's Division of Colorado River Resources. As indicated in the draft supplement there is a potential for disturbance of the natural flora and fauna particularly certain wildlife associated with the river and the adjacent mountain regions. It would seem to me that the effects of utilizing this land for development purposes (which I understand is the State's intent) would further deteriorate the present wildlife habitate to its detriment.

The archeological inventory was limited to two quadrats for every section. Obviously the remainiog quadrats of each section have not been inventoried so their cultural resources or potentials are unknown. I would question the ability of the State of Nevada to insure the protection of the resources inventories in this report and cited as historical or prehistorical, since the State of Nevada has not had a SHPO Office since July 1, 1976 and I am not certain if that office is functioning even yet. I realize that the State is attempting to re-establish this office but until such a time as it is determined that the State is supporting a SHPO Office recognized by the Federal Government, there is not assurance that cultural resources on State lands can be effectively inventoried, protected, preserved or mitigated should urban or other incroachments affect it.

Sincerely yours,

STBrooks

Sheilagh T. Brooks
Chairman

STB/jlb

016

April 11, 1977

Honorable Cecil D. Andrus
Secretary of the Interior
Office of the Secretary, Room 6151
U.S. Department of the Interior
Washington D.C. 20240

Re: Final Environmental Statement (1/23/75) and Supplement N-911 (3/8/77) on Proposed Sale of Fort Mojave Lands, Nevada, involving transfer of 9,000 acres of National Resource Lands in Clark County, Nevada, to the State of Nevada

Dear Secretary Andrus:

Your proposed action on the above-captioned matter has recently come to my attention. Having myself been familiar with this area of southern Nevada since 1968 when I began photographically recording the rock art there, I would like to afford you these comments regarding the archeological and historical resources portion of your EIS.

By way of background, I should explain that I have used this area since 1968 for purposes of education, research, and recreation. In 1969 and 1970, I was involved through a program sponsored by the Southern Nevada Museum to conduct educational field trips for the disadvantaged secondary school students of the Las Vegas and Henderson area. I designed a field experience for these students to the Christmas Tree Pass-Grapevine Canyon area around Spirit Mountain in the Newberry Mountains just adjoining your area of proposed sale to the north. Here the students were introduced to ethnobotany (having lunch prepared from native plant foods), to ethnology and native American religion (listening to the dream experiences of Mohave, Walapai and Yuman shamans who came to this sacred area and had their accounts recorded by anthropologists), and to prehistoric rock art at Grapevine Canyon. This introduction to the natural history of their state was culminated when each student was isolated in Grapevine Canyon and spent one hour completely alone with himself and the natural environment. For some students this was the first time they had ever been alone like this in their lives.

From 1972 through 1973, I was under contract with the Desert Planning Staff of the California State Office, U.S. B.L.M., to inventory and photograph all prehistoric rock art sites in the eastern California Desert Planning Area. My inventory work

016

took me, in this instance, to Granite Tanks and Picture Canyon in the Dead Mountains just adjoining your area of proposed Sale.

In the spring of last year, I led volunteers from the Desert Watch, Society for California Archeology, to fence the Ft. Mojave intaglios just across the Colorado River from your area of proposed sale. This protective project was on Mojave Indian Reservation Lands, and the tribe members not only gave their consent, but also worked side by side with the Desert Watch volunteers to preserve these outstanding intaglios.

I am currently employed by Riverside County Parks Department as the National Register Program Coordinator for the major archeological districts in Riverside County, California. Consequently, I have become familiar with the National Register criteria and procedures for nomination to the Register. Additionally, I also teach extension courses in the prehistoric rock art of southern California year-round at the University of California, Riverside. My classes have a weekend field trip to rock art sites of the region which includes the Topock Maze intaglio south of Needles, California, and the Ft. Mojave intaglios just south of Bullhead City on the Arizona side of the Colorado River. Some of the more eager students also visit the Grapevine Canyon and Hiko Springs petroglyph sites adjoining the area of your proposed sale.

To sum up, I am familiar with many of the major archaeological resources surrounding your area of proposed sale. I have found it to be an extremely rich area for educational and research use, to say nothing of the personal inspiration I have gained in my visits there. I am concerned because of the unprotected status of most of the principal cultural resources in the area, and have tried, in my small way, to bring about some measure of protection to a few of the many fine archeological sites.

You can then imagine my apprehension when I learned that your proposed sale of lands would culminate in the establishment of extensive new facilities and population influx to this rich, largely unprotected area. My apprehension grew when I found that your EIS did not take into account secondary impacts from the anticipated influx of population. I consider this as serious an omission as if omitted from an impact statement for a proposed power plant such as, say, the Sundesert Nuclear Proposal farther south by Blythe, California. That particular project will result in about 7,200 new residents during the peak construction phase. I found no data detailing the number of new residents and occasional users attracted to the area by your proposed sale, nor the impact these people would have, particularly by way of off-road vehicle impacts, to the area.

The second area of my concern involved the way in which your "Cultural Resources Inventory" handled evaluation of

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archeological and historical properties identified during the survey-sampling done by the Nevada Archeological Survey. Evidently that survey was done "at BLM clearance level, Class 3, Intensive Survey in accordance with the Nevada BLM Information Memorandum No. NSO 76-59 (N-930.41)," (EIS supplement, p. 31) and "all sites were evaluated by the BLM Cultural Resource Evaluation System (CRES) in the field to determine their cultural significance." (EIS supplement, p. 41) The five rating codes of CRES are found on pages 7-9 of the same document. These rating codes were evidently applied to determine if a site met the criteria for nomination to the National Register of Historic Places under 36 CFR 800.10. However, the CRES rating codes bear no resemblance to the National Register criteria. Only if an individual site was determined to rank at "Level S-1," was it considered to be of National Register caliber.

The obvious question here is why weren't the National Register Criteria themselves directly applied as mandated in 36 CFR 800.4, instead of interposing an alien set of CRES criteria? The resultant situation is untenably topsy-turvy: CRES criteria are used to determine National Register criteria. Consequently, your entire evaluation procedure becomes a pointless and illegal non sequitir. You have not even begun to comply with 36 CFR 800. This failure is not the fault of the archeologists you employed: your own contract instructions are to blame. Nevada Archeological Survey provided you with sound data, but your inept CRES criteria made it impossible to properly and legally evaluate that data.

My third area of concern is that, although the numerous lithic quarry sites recorded in the sampling-survey were found to follow the availability of lithic materials on the second ancient river terrace, the entire sweep of sites along that terrace was not considered as a single archeological district. The integral relation of all sites along this ancient terrace of river cobbles makes it an obvious archeological district (36 CFR 800.1). Considering each site as an isolated individual ignores this fact, and makes impossible the proper application of the National Register criteria. As a district, it would be my judgment that this entire site-complex meets criteria #4 for nomination to the National Register of Historic Places (36 CFR 800.10). We have a similar situation at the preferred site of the Sundesert Nuclear Plant on the Palo Verde Mesa south of Blythe, California, where a very similar lithic assemblage has been found to meet criteria #4. I would refer you to the testimony of Jay von Werlhof before the State Energy Resources Conservation and Development Commission on this very point, and to Mr. von Werlhof's "Archeological Investigations of the Sundesert Nuclear Site."

My fourth area of concern is that, although M
Townley of the Nevada Historical Society in his le
November 5, 1976, (EIS supplement, p. 31) points ou

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"comparison of the project map with 19th century maps of the area showed that the road extending south from Section One, T12N, R65E, at BM 1406, to Section Seventeen, T12N, R66E, and beyond, was part of the Government Road connecting Fort Mohave and San Bernardino," this highly important historical resource is not mentioned again in your EIS Cultural Resource Inventory, muchless evaluated for its National Register potential. This unexplained omission is of great concern since you obviously have on the subject property an historical resource which is universally deemed (cf. the definitive works of Mr. Dennis Casebier) to have significantly contributed to "the broad patterns of our history," as defined under criteria #1 of 36 CFR 800.10.

I hope you find these comments helpful in finalizing your Draft EIS on the above-captioned matter. I would like to request that I be kept informed as to the status of your project involving these subject properties.

Sincerely yours,

Ike C. Eastvold

Ike C. Eastvold, Chairman
California Desert Archeology Committee
"Desert Watch"
Society for California Archeology
541 Prospect Street
Highgrove, California 92507
(714) 787-0870 - home
(714) 787-2551 - work

cc: E.I. Rowland, State Director, BLM
Room 3008, Federal Bldg.
300 Booth Street
Reno, Nevada 89509

Roger McCormack, Asst. State Director, BLM
Room 3008, Federal Bldg.
300 Booth Street
Reno, Nevada 89509

Natural Resources Defense Council, Inc.
Attn. Johanna Wald
2345 Yale Street
Palo Alto, California 94301

Environmental Defense Fund
Attn. Richard Gutting
2778 Durant Avenue
Berkeley, California 94704

Charles S. Watson, Jr., Director
National Public Lands Task Force
P.O. Box 1245
Carson City, Nevada 89701

Advisory Council on Historic Preservation, Washington D.C.

018

MIKE O'CALLAGHAN
Governor

NEVADA

NEVADA
STATE
PARK
SYSTEM

JOHN L. MEDER
Administrator

ROOM 221
NYE BUILDING
201 S. FALL STREET
CAPITOL COMPLEX
CARSON CITY,
NEVADA 89710
(702) 885-4384

In Reply Refer to:
561-BLM

APR 15 1977

Mr. E. I. Rowland
State Director (N-911)
Bureau of Land Management
Federal Building
300 Booth Street
Reno, Nevada 89509

Dear Mr. Rowland:

When this office first reviewed the Draft Supplement to the Final Environmental Statement, Proposed Sale of Fort Mohave Lands, Nevada, we concurred with the recommendations found on page 13 of the Draft (reference: our letter dated March 15, 1977).

The recommendation states "Colorado River Council contract an intensive archaeological survey . . . " (sic) of units unsurveyed by the BLM, prior to state development or sale of Fort Mohave lands. At the time of our comments, we were under the assumption that a prior agreement to survey had been made between the Bureau and the Colorado River Commission. However, a subsequent inquiry by staff members showed that this is not the case.

Therefore, it is our revised opinion that the cause of cultural resource preservation and the intent of the Executive Order 11593 would be best served if the Bureau completed its survey of archaeological and historical resources within the Fort Mohave Lands prior to relinquishing control of the area. Should your office disagree

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018

APR 15 1977
Mr. E. I. Rowland
Page 2

with this recommendation, we would request that the question of procedure be determined by an opinion from the National Adivsory Council.

Sincerely,

John L. Meder

John L. Meder
Administrator
(State Historic Preservation Officer)

cc: Bruce Arkell
Steve Robinson
Don Paff

019

STATE OF NEVADA
GOVERNOR'S OFFICE OF PLANNING COORDINATION
CAPITOL BUILDING, ROOM 48
CAPITOL COMPLEX
CARSON CITY, NEVADA 89710
(702) 885-4865

April 19, 1977

Mr. E. I. Rowland, State Director
Bureau of Land Management
Federal Building, 300 Booth Street
Reno, Nevada 89509

Re: SAI NV #75900044 - Draft Supplement to Final ES - Proposed Sale of Fort Mohave Lands

Dear Mr. Rowland:

Attached are comments from the Department of Fish and Game and Colorado River Resources concerning the above referenced project.

These comments constitute the State Clearinghouse review of this proposal, and we would appreciate it if you would incorporate these comments in your final statement.

Sincerely,

Bruce O. Arkell
State Planning Coordinator

BOA/cc

Attachments

cc: Department of Fish and Game
Colorado River Resources

019A

STATE OF NEVADA
DIVISION OF
COLORADO RIVER RESOURCES
P.O. Box 19090
LAS VEGAS, NEVADA 89118
TELEPHONE (702) 733-7755

MIKE O'CALLAGHAN
Governor

DONALD L. PAFF
Administrator

April 9, 1977

Memorandum

To: Norman S. Hall, Director, Department of Conservation and Natural Resources

From: Administrator, Division of Colorado River Resources

Subject: Draft Supplement to the Final Environmental Statement - Proposed Sale of Fort Mohave Lands, Nevada Prepared by Bureau of Land Management (INT FES 75-10)

In our April 8, 1977 memo we inadvertently omitted a comment and possible correction in the draft supplement.

On pages 12 and 13 under the heading of "Mitigating Measures Included in the Proposed Action", we have assumed that "Colorado River Council" should be Nevada Division of Colorado River Resources. Our comments provided in our April 8 memo are based on this change. We have no knowledge of an organization involved in the Fort Mohave lands with the name of Colorado River Council.

We request this comment be also transmitted to the State Clearing House.

Don
Donald L. Paff

cc: Brian McKay, Deputy Attorney General

RECEIVED
APR 12 1977
Department of Conservation
and Natural Resources

A DIVISION OF THE DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
ELMO J. DeRICCO, DIRECTOR

019A

STATE OF NEVADA
DIVISION OF
COLORADO RIVER RESOURCES
P.O. Box 19090
LAS VEGAS, NEVADA 89119
TELEPHONE (702) 733-7755

MIKE O'CALLAGHAN
Governor

DONALD L. PAFF
Administrator

April 8, 1977

RECEIVED
APR 11 1977
Department of Conservation
and Natural Resources

Mr. E. I. Rowland, State Director
U. S. Bureau of Land Management
Room 3008 Federal Building
300 Booth Street
Reno, Nevada 89502

Dear Mr. Rowland:

C O P Y

Your letter of March 9, 1977 transmitted to us two copies of the March 8, 1977 draft supplement to the Final Environmental Statement for the sale of Fort Mohave lands to the State of Nevada (INT FES 75-10). Also by your letter of March 10, you advised that 25 copies of the draft supplement had been forwarded to the Nevada State Clearinghouse and additional copies had been mailed to other members of the public.

We have reviewed the draft supplement and will be providing our comments to the Nevada State Clearinghouse for assembly and transmittal to you with other State agency comments.

With regard to the comments received, we request that all comments be included and addressed in the final supplement filed with the Council of Environmental Quality (CEQ). When this final supplement is transmitted to CEQ, we request that you provide this office four copies for our use and files.

In review of the schedule of actions required by the Secretary of Interior pursuant to the Further Amendment to Contract of Sale Between the United States and the State of Nevada signed by the Secretary of Interior on June 22, 1976 and Governor O'Callaghan on June 23, 1976, we request you provide us at the earliest possible date the schedule of actions to be taken and information you will provide the office of the Secretary of Interior relating to Secretarial actions not later than June 1, 1977, as required by the Amendment (Article VIII). In the development of the schedule of actions and information, we seek the fulfillment of the commitment by the Secretary's office that the State will be involved and will be consulted as to his determinations required under Article VIII prior to making such determination final.

As you are well aware the time available prior to June 1, 1977 is extremely limited and thus we urge your early response so that we may jointly accomplish the remaining activities in a timely fashion.

Sincerely,

DLP

Donald L. Paff
Administrator

✓ cc: Mr. Norman S. Hall, Director
Dept. of Conservation
Brian McKay, Deputy Attorney General

A DIVISION OF THE DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
ELMO J. DeRICCO, DIRECTOR

019A

STATE OF NEVADA
DIVISION OF
COLORADO RIVER RESOURCES
P.O. Box 19090
LAS VEGAS, NEVADA 89118
TELEPHONE (702) 733-7755

MIKE O'CALLAGHAN
Governor

DONALD L. PAFF
Administrator

April 8, 1977

RECEIVED
APR 11 1977
Department of Conservation
and Natural Resources

Memorandum

To: Norman S. Hall, Director, Department of Conservation and Natural Resources

From: Administrator, Division of Colorado River Resources

Subject: Draft Supplement to the Final Environmental Statement - Proposed Sale of Fort Mohave Lands, Nevada Prepared by Bureau of Land Management (INT FES 75-10)

Reference: Environmental Statement for the Sale of Fort Mohave Lands to the State of Nevada; Draft Statement dated December 27, 1972, Final Statement submitted to Council on Environmental Quality January 23, 1975. Nevada State Clearinghouse Identification SAE 75900044

We have reviewed the subject draft supplement and are providing our comments to you for your transmittal with other Department or Division comments to the State Clearinghouse. We have not received a clearinghouse request for comments but are advised that on March 9, 1977 25 copies were sent to the clearinghouse by the Nevada State office of the Bureau of Land Management (BLM) indicating written comments would be accepted until April 11, 1977 addressed to the Nevada State Director of BLM.

We are attaching our general comments with appropriate references. We are also attaching our detailed comments which are identified by page number.

Don
Donald L. Paff

Att. 2

cc: Brian McKay, Deputy Attorney General w/Att.2

A DIVISION OF THE DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
ELMO J. DeRICCO, DIRECTOR

019A

DCRR
4/8/77

GENERAL COMMENT
on

Draft Supplement to the Final Environmental Statement - Proposed Sale of Fort Mohave Lands, Nevada, prepared by Bureau of Land Management dated March 8, 1977

1. The information provided as to environmental impacts or mitigating measures implies a proposed action as described under Alternative 3 in the Final Statement, i.e. on page 13 "Waterways to be developed under the proposed action could result in additional cattail sites which would fulfill the habitat requirements of the Yuma Clapper Rail". On page 9 of the final statement it clearly indicates that the alternative actions are identified to represent both minimum and maximum development and -- "Actual development could be something in between". (Ref. I)

2. The Archaeology (Cultural Resources) investigation is not complete pursuant to Section 2 of Executive Order 11593. (Reference II)

3. Supporting data and information on Flood Hazard Evaluation should be provided in Appendix B and should identify drainage areas, topography and natural drainage courses considered, calculations, assumptions, data, etc. The Corps of Engineers' letter dated September 7, 1976 identifying that the hazards are based on preliminary studies. Executive Order 11296 appears to be unfulfilled (Ref.III). Because of the map scale it is impossible to determine the extent of the overflow limits of the Colorado River in the flood plain and the relationship of the Corps of Engineers analyses as compared to the Bureau of Reclamation analyses (Ref. IV).

4. Wildlife mitigating measures identifies development of cattail habitat (20 acres) in contradiction to the natural (unaltered) decline of habitat and the absence of the Yuma Clapper Rail. Since any of the actions identified in the Final Statement do not impact on suitable habitat, a development of a habitat (20 acres) cannot be considered as a mitigating measure but only a development of a potential habitat. See page 27 (p.11) "In view of the preferences exhibited throughout its range for habitat areas in excess of 20 acres in size, the significance of these cattail pockets to the Yuma Clapper Rail is nil."

5. Flood Management planning identified in mitigating measures assumes a current and identifiable development plan which is not available (See Comment 1 above). Additionally, we question the need of approval of the Secretary of Interior for conformance to Federal Insurance Administration National Flood Insurance Program since qualification for financing developments.

DCRR
4/8/77
Page 2 of 2

GENERAL COMMENTS (contd.)

6. Mitigating measures relating to flood hazards and archaeological values are not identified. Only further investigations or studies are identified which may or may not require mitigating measures. Pursuant to Executive Orders 11593 and 11296, and Article VIII of the Amendment to Sale Contract, the identification of environmental and related impacts are the responsibility of the Secretary of Interior. (Ref.V)

DCRR
4/8/77

REFERENCES

I. Final Environmental Statement for the Sale of Fort Mohave Lands to the State of Nevada, dated January 23, 1975 (INT FES 75-10)

II. Executive Order 11593, May 13, 1971 - Filed with the Office of the Federal Register 12:18 pm May 14, 1971

III. Executive Order 11296, August 11, 1966

IV. Flood Plain Information - Colorado River, Davis Dam to Topock, United States Bureau of Reclamation, March, 1969.

V. Amendment to Contract of Sale between the United States and the State of Nevada pursuant to the Act of April 22, 1960 (74 Stat.74) dated March 28, 1972. Also, amendments dated February 17, 1976 and June 28, 1976.

DCRR
4/8/77

DETAILED COMMENT
on

Draft Supplement to the Final Environmental Statement - Proposed Sale of Fort Mohave Lands, Nevada, prepared by Bureau of Land Management dated March 8, 1977

Page i, 2. Brief Description of Action, first paragraph.
The last sentence should read; The Purchase Period allowed the Division of Colorado River Resources following the date the Secretary approves and supplies to the Division in writing his final terms, conditions and stipulations for the protection of the environment is six years.

Page ii, first full paragraph.
The sentence should read; The potential impacts considered as adverse concern cultural resources and flood hazards. (Also see GENERAL COMMENTS).

Page 2, first sentence.
The sentence should read; Provisions within Article VIII of the March 28, 1972 Amendment to the contract provide..."

Page 21, map.
Concentration Point 8 not shown on map. The map is of such a scale to be of little value in determining limits of flood hazards. (Also see GENERAL COMMENTS)

Page 30, p.2.
Change November 32, 1976 to November 23, 1976 (?)
Errata Sheet indicates changes to pages 27, 29, 32, 34, 38, 40, 41, 44, 47, 49, 51, 52, 54, 56, 61, 62, 63. There are no such pages included in the draft supplement.

Page 37, map
Should indicate land areas already purchased by the State, those reserved by the Bureau of Reclamation and those in private ownership.

Page 38 (P 20) (p 22)
Plate 20 not included or identified

Page 41 (P25)
The contract between NAS and BLM should be included because of repeated reference as to methods, requirements, etc.

Page 41
(pages 27 through 64) not included?

DCRR
4/8/77
Page 2 of 2

DETAILED COMMENT (contd.)

Page 42 (p.67)
Site 26 Ck 1413 not identified on pages 45 or 46?

Page 42 and 43
Rearrange (pages 71 and 70). (Page 72) missing?

Page 43 (p.73)
Survey units 14-1 and 3 and 23-1 shown on map on page 44 but not tabulated.

Page 44, map
See comments on map on page 39; legend should be added and map symbols made more legible.

Page 45 and 46 (pages 79, 80, 81 and 82)
No reference is made to survey unit nor is a description of site number, catalog number shown. The information is useless to the reader unless definition is provided.

019A

561-BLM

Mr. E. I. Rowland
State Director (N-911)
Bureau of Land Management
Room 3008
Federal Building
300 Booth Street
Reno, Nevada 89509

Dear Mr. Rowland:

This office has reviewed the Draft Supplement to the Final Environmental Statement, Proposed Sale of Fort Mohave Lands, Nevada. We appreciate the opportunity to offer comment. Our comments will be confined to those portions of the Supplement which deal with cultural resources.

We concur with the recommendations of the Nevada Archaeological Survey that the Colorado River Council Contract for additional archaeological survey prior to sale or development of lands within the area of concern. The Bureau of Land Management has reiterated the recommendation on Page 13 of the draft as an affirmation of intent.

We do not see a similar Bureau of Land Management acknowledgement or affirmation of the recommendations made by the University of Nevada, Las Vegas, History Department and the Nevada State Historical Society, Reno, relative to known historic sites and mitigating measures against adverse affect. Perhaps the reproduction of the comments as incorporated in the draft was intended to serve this purpose, but we would prefer to read a more affirmative and direct declaration on the part of the Bureau of Land Management.

Our final comment is in the nature of a request; that future E.I.S. preparations dealing with the determination of eligibility of places to the National Register,

019A

Mr. E. I. Rowland
Page 2

include provisions for consultation with this office; as per 36 CFR 800.4, Federal Register, Vol. 41, No. 23, February 10, 1976.

Again, thank you for the opportunity to comment.

Sincerely,

John Meder, Administrator
(State Historic Preservation Officer)

By: John Richardson, Assistant Administrator
(Alternate, State Historic Preservation Officer)

JR:BF:fp

cc: Steve Robinson
Bruce Arkell

019A

561-BLM

Mr. Donald L. Paff
Administrator
Division of Colorado River
Resources
P.O. Box 19090
Las Vegas, Nevada 89119

Dear Mr. Paff:

This office has already reviewed the Bureau of Land Management's draft, "The Fort Mohave Cultural Resource Inventory, An Archaeological/Historical Field Investigation in Southern Clark County, Nevada". Much of what you have enclosed with your letters of March 3 and 15, 1977, was incorporated in the draft, so the staff review comments would still apply.

Enclosed for your files is a copy of the review comments forwarded to the Bureau of Land Management's state office. If you still wish to get together for a discussion of this matter, please let me know.

Sincerely,

John L. Meder
Administrator

JLM:RF:fp

Encl.

019B

PLANNING COORDINATOR
GOVERNOR'S OFFICE
CAPITOL BUILDING, ROOM 45
CAPITOL COMPLEX
CARSON CITY, NEVADA
885-4865

MEMORANDUM

Date: March 30, 1977

For: Department of Fish & Game; Department of Conservation & Natural Resources; Department of Human Resources

From: Bruce D. Arkell

Subject: SAI NV #75900044 - Draft Supplement to Final ES - Proposed Sale of Fort Mohave Lands

Attached for your review and comment is a copy of the above mentioned project.

Please submit your comments to this office no later than 4/8/77. If you have no comments please let us know by this date also, so that we may complete our processing.

BDA/jh

Attachment

019a

1977 MAR

March 25, 1977

Mr. Donald L. Paff
Administrator
Colorado River Resources
P.O. Box 19090
Las Vegas, NV. 89119

Dear Mr. Paff:

Our personnel have reviewed the draft Environmental Statement "Proposed Sale of Fort Mohave Lands, Nevada".

We can find no impacts for the endangered species considered from the habitat standpoint. However, the fact should be considered that we have documented seasonal use by peregrine falcons on the lower Colorado River in October and March. Also, Bald Eagle observations have been recorded for fall, winter and spring months (Oct.-March). In other words, these endangered species find this area suitable for use seasonally regardless of habitat requirements.

Our recommendations would be that mitigative action should include a continuous monitoring survey for endangered species use of this area and plans to protect wintering areas from development.

Sincerely,

Cleo K. Griffith
Director

vh
cc: Bruce Arkell

020

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT, CORPS OF ENGINEERS
P. O. BOX 2711
LOS ANGELES, CALIFORNIA 90053

SPLED-E 12 April 1977

Mr. E. I. Rowland
State Director (N-911)
Bureau of Land Management
Room 3008, Federal Building
300 Booth Street
Reno, Nevada 89509

Dear Mr. Rowland:

This is in response to a letter from your office dated 9 March 1977 which requested review and comments on the draft supplement to the Final Environmental Statement for the Sale of Fort Mohave Lands to the State of Nevada (INT FES 75-10).

With respect to the draft supplement, we offer the following comments:

a. Page 11, 2nd paragraph: The statement that "no observable sites were encountered during the survey within the flood plain" should be clarified. As noted in Appendix B, page 20 of the supplement, the entire site is subject to sheet flow. If it is meant to denote that no sites in the "Colorado River flood plain" were encountered, the statement should be amended to reflect this fact.

b. Page 12, 1st paragraph: The reference to "waterways" should be expanded to denote what waterways are meant. Also, is it inferred, in the last sentence of the paragraph, that the present levee will wash out for a 100-year event, or that it will be removed as part of the proposed plan? This should be clarified.

c. Page 12, 2nd paragraph: Flood depths and potential for damage would be dependent on the construction measures undertaken. This should be clarified. The phrase "will increase" should be changed to "could increase."

020

SPLED-E 12 April 1977
Mr. E. I. Rowland

d. Page 13, 4th paragraph: The reference to "waterways" should be expanded to denote what waterways are meant and the inference that they may be intentionally provided should be clarified. It should be noted that our flood hazard evaluation was for existing conditions and that development of these "waterways" could alter the analysis.

e. Page 14, 2nd paragraph: Change "will cause" to "could cause" since much depends on the construction measures used. If damage cannot be prevented, it can at least be significantly reduced.

f. Appendix B, Table of Discharges: It should be noted that some of these discharges are not concentrated at a specific point location, but are determined along a "frontal line" corresponding to a drainage area above the line. Before any analyses are made using these values, the user should coordinate with the Los Angeles Engineer District. If we can be of any further assistance in this matter, please contact Mr. Joseph B. Evelyn, Chief, Hydrology Section, telephone (213) 688-4753.

Thank you for the opportunity to review and comment on this draft supplement.

Sincerely yours,

Taichi L. Nishihara
TAICHI L. NISHIHARA
Acting Chief, Engineering Division

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021

CALIFORNIA STATE UNIVERSITY • LOS ANGELES
5151 STATE UNIVERSITY DRIVE LOS ANGELES, CALIFORNIA 90032

April 20, 1977

Mr. Cecil O. Andrus
Office of Secretary, Room 6151
U.S. Department of Interior
18th & "C" Street
Washington, DC 20240

Dear Mr. Andrus:

We have completed a botanical survey of the 9,000 acres of the Fort Mohave Lands proposed for sale to the State of Nevada. The survey was conducted on April 15, 16,17, 1977 by 2 post-graduate, 8 graduate, and 7 undergraduate students and myself. The purpose of this survey was to describe and evaluate the conditions of the existing vegetation types and to make possible additions to the checklist of plants presented in the Draft Supplement (INT FES 75-10).

FLOOD PLAIN:

The floodplain of the sale parcel is dominated by dead and dying stands of arrow-weed bushes and brush (Pluchea sericea) interrupted by stringers of introduced tamerisk (Tamerix chinensis) and screwbean mesquite (Prosopis pubescens), with lesser amounts of honey mesquite (Prosopis glandulosa). Tamerisk is the only species that is vigorous and/or reproducing.

The vegetation of the floodplain is severely deteriorated as a result of lowered water tables caused by the channelization of the Colorado River and because of extreme overgrazing. The area previously supported stands of native grasses which are gone, some willow trees (Salix sp.) which are almost all dead, and occasional cottonwood trees (Populus fremontii) that are now dead. The floodplain soils are almost completely devoid of herbaceous cover.

In several places, sand dunes have formed that have been partly stabilized by tamerisk trees. Most of these appear to have been formed as a result of the lowered water table, overgrazing, and the burning of decadent plants, which has allowed the formerly stabilized river-deposited sands to be wind blown into dunes. The windward sides of each dune system is occupied by a blown-out sand depression.

Scattered throughout the floodplain are generally bare areas of sandy-loam soils created by the fire removal of the dying and dead grasses and shrubs, and the subsequent removal of the fire-following plants by livestock overgrazing.

A few secondary river channels or oxbows still remain and retain some standing water. These aquatic sites contain decadent and choking wind-lodged stands of cattails (Thypa angustifolia), which unless rejuvenated by an occasional flood or fire will soon die. The largest slough is still open with a minimum of aquatic vegetation. The salt grass (Distichlis spicata) and Juncus sp. ground cover around this ope disturbed by livestock, and adversely affected by rapidly fluctuating water levels. Much of this wet area is being invaded by thicket stands of the nearly useless and alien tamerisk.

The vegetation and soils of the floodplain are in an extreme state of deterioration as a result of private, state, and federal mismanagement, and the area is a prime example showing that soil erosion, overgrazing, misuse of water resources, and the destruction of ecosystems are not something of the past that only occurred during the "dust bowl" era of the dirty 1930's.

UPLANDS:

The uplands of the sale parcel are composed of coalesced alluvial fans or a bajada derived from the surrounding mountains, including one partially-intact fan that appears to have been derived from the mountains to the east in Arizona, and that has been subsequently dissected by the Colorado River. The uppermost slopes are punctuated by rocky hills or outcrops. One major wash traverses the property near the Nevada-California state line, and other minor arroyos occur periodically across the bajada.

The lower half of the uplands have been marred by a grid of old roadcuts that extend down into the lowlands and subdivide the area into streets or 40-acre strips. In addition, a series of exploration pits and their spoilbank mounds transect the entire property. A pipeline and buried utility cable also cross the property and have caused visual and vegetational disturbances. Several powerlines and their rights-of-way roads also cross the parcel.

The uplands are dominated by a sparse creosote bush-bur sage scrub (_Larrea tridentata-Ambrosia dumosa_). Creosote bush is usually the most common species, but on lower slopes the two species often occur in about equal proportions. The Arizona-originated alluvial fan supports a pure stand of stunted creosote bushes and a well-developed and stable cobble pavement.

An additional dominant plant on the upper slopes is brittlebush (_Encelia farinosa_). Common subdominants on the uplands include pencil cholla cactus (_Opuntia ramosissima_), vine milkweed (_Sarcostemma hirtellum_), bush milkweed (_Asclepias subulata_) and beaver-tail cactus (_Opuntia basilaris_). Some rocky knolls are dominated by indigo bush (_Dalea parryi_). A number of other species occur, but in very low numbers (see attached checklist).

The lower-slope soils are generally devoid of herbaceous plants. The mid-slopes support a light cover of fescue grass (_Festuca octoflora_), along with carpet weed and the introduced grass (_Schismus arabicus_). Hill and ridge tops are severely eroded with either loose unvarnished, or soil-pediceled rocks. The main ground-cover plant is carpet weed which is indicative of disturbance. The slopes and valleys support recent erosional cuts and channels. The bare ridges, the erosional channels, and the weedy and unpalatable nature of the vegetation are considered to be a result of persistent overgrazing. Livestock damage decreases as slope elevations increase.

The main wash contains a good stand of smoke trees (_Dalea spinosa_), which may be near their northern limits in Nevada. The smoke trees were observed to be reproducing. Dominant plants in the wash include cheesebush (_Hymenoclea salsola_), brittlebush, creosote bush, coyote melon (_Cucurbita palmata_), catsclaw acacia (_Acacia greggii_), desert lavender (_Hyptis emoryi_), pencil cholla, and vine milkweed. The less sandy areas contain a sparse cover of fescue grass and carpet weed. Additional species were uncommon or extremely local. The main wash has been disturbed by a now inactive gravel pit and a rock quarry.

RECOMMENDATIONS:

It is obvious that the previous inventories were incomplete. The plant species found in this survey nearly doubled the number found in 1976, but still cannot be considered to be complete because additional field work at various seasons is needed.

The present vegetation is in a general degraded state, being in the worst condition in the lowlands and in better condition on the upper slopes. The vegetation cannot be considered to be worthless, however, because of its present degraded and unproductive state. Uncommon and rare species may exist in the area. Other common species may reach the edges of their ranges in the area. Species such as smoke tree, as well as other Sonoran Desert species, appear to reach their northern limits in the survey area.

The river-dissected alluvial fan in Sect. 9, may also be an unusual geological feature worth preserving. The toe of this fan appears to support ice-age artifacts and may support archeological sites. We found a triangular flint scraper, a quartz chopper, and pottery sherds. If the 1976 archeological survey was conducted on the most likely areas, as opposed to the grid sampling used, we believe that archeological evidence would have been more substantial.

The floodplain or lowland should not be destroyed or developed because of the uniqueness of this vegetation type, and the key role that lowlands play in desert systems. Lowland/wetlands have always been a minor but important component of deserts, and are now at a premium because they are rapidly diminishing. The lowlands to the south in California, for example, have been almost entirely developed for agriculture.

The lowland portion of the sale parcel contains potentially productive wildlife habitat. The remaining wetlands, for example, could with minimum management, be restored to prime Yuma clapper rail habitat. During a eight-person sweep of the largest cattail slough, the call of an unidentified rail was heard 3 times, and a common snipe, American bittern, goldfinch, and unidentified sparrow were flushed. A number of other birds were also observed throughout the parcel. The lowland area could not only be restored to excellent shorebird/waterfowl habitat, but could also support mule deer, gambel quail, and morning doves in good numbers.

The soils of the floodplain vary from sterile sands, rich sandy loams, and salty silts, and could support a variety of vegetation and wildlife. These areas are nicely juxtaposed upon one another to form a maximum number of edges so favorable for full wildlife expression. Such valuable areas are needed to provide habitat for wintering migratory shorebirds and waterfowl. In addition, wetlands amidst desert are now critical for the continued survival of a wide array of both desert and wetland organisms.

As a result, we recommend that the area be seriously considered with these findings and suggestions in mind, before the land is turned over or sold to agencies that might develop it. If nothing else, the alternative of postponing action should be considered, thereby allowing future peoples and generations the option of making their own decisions. This is particularly important since many things that could be done to this parcel in its development could be irreversible. Later we may want the plants, wildlife, or soils that this area now could support, but there will be no way to bring them back.

Sincerely,

Richard J. Vogl

Richard J. Vogl
Professor of Biology

cc: E. I. Rowland, State Director, BLM
Room 3008, Federal Bldg.
300 Booth Street
Reno, Nevada 89509

Roger McCormack, Asst. State Director, BLM
Room 3008, Federal Bldg.
300 Booth Street
Reno, Nevada 89509

Natural Resources Defense Council, Inc.
Attn. Johanna Wald
2345 Yale Street
Palo Alto, CA 94301

Charles S. Watson, Jr., Director
National Public Lands Task Force
P.O. Box 1245
Carson City, Nevada 89701

PLANT CHECKLIST - FORT MOHAVE
Lands, Nevada April 18, 1977

(Prepared by Barry Prigge - Biology Dept. - Calif. State Univ., Los Angeles)

- Gnetae
  - Ephedraceae
    - _Ephedra aspera_
- Angiospermae
- Dicotyledones
  - Asclepiadaceae
    - _Asclepias subulata_
    - _Sarcostemma hirtellum_
  - Asteraceae (Compositae)
    - _Ambrosia dumosa_
    - _Aster carnosus_ or _intricatus_*
    - _Baileya pleniradiata_
    - _B. pauciradiata_*
    - _Bebbia juncea_
    - Chaenactis carphoclina
    - Dyssodia porophylloides (?)
    - Encelia farinosa
    - E. frutescens
    - Erigeron spp.*
    - Eriophyllum lanosium (?)
    - Hymenoclea salsola
    - Machaeranthera tephrodes
    - Monoptilon bellioides
    - Palafoxia linearis
    - Perityle emoryi
    - _Peucephyllum schottii_
    - Pluchea sericea
    - Psathyrotes ramosissima
    - Stephanomeria exigua
    - Trichoptilium incisum
    - Trixis california
  - Bignoniaceae
    - _Chilopsis linearis_*
  - Boraginaceae
    - _Amsinkia tessellata_
    - _Coldenia plicata_
    - _Cryptantha angustifolia_
    - C. spp.
    - Heliotropium curassavicum
  - Brassicaceae
    - _Caulanthus cooperi_
    - _Lepidium lasiocarpum_
    - L. spp.*
    - _Sisymbrium irio_
  - Cactaceae
    - Echinocactus engelmanni
    - Ferocactus acanthodes
    - Opuntia acanthocarpa
    - O. basilaris
    - O. echinocarpa
    - O. ramosissima
    - Mammillaria microcarpa
  - Chenopodiaceae
    - Atriplex polycarpa*
    - Salsola kali
  - Cucurbitaceae
    - Cucurbita palmata
  - Euphorbiaceae
    - Croton californicus
    - Ditaxis neomexicana
    - Euphorbia polycarpa

- Fabaceae (Leguminosae)
  - Acacia constricta (?)
  - Acacia greggii
  - Dalea californica
  - D. mollissima
  - D. parryi
  - D. spinosa
  - Lotus tomentellus
  - Lupinus sp.
  - Prosopis glandulosa var. torreyana
  - P. pubescens
- Hydrophyllaceae
  - Nama depressum
  - Phacelia crenulata
- Krameriaceae
  - Krameria grayi
- Lamiaceae
  - Hyptis emoryi
  - Salazuria mexicana
  - Salvia columbariae
- Loasaceae
  - Eucnide urens*
  - Mentzelia perbula
  - M. veatchiana
- Malvaceae
  - Sphaeralcea ambigua
- Nytaginaceae
  - Abronia villosa
- Onagraceae
  - Camissonia boothii
  - C. brevipes
  - C. claviformis
  - Oenothera deltoides
- Orobanchaceae
  - Orobanche cooperi
- Papaveraceae
  - Eschscholtzia minutiflora
- Plantaginaceae
  - Plantago insularis
- Polemoniaceae
  - Eriastrum erenicum
  - Gilia spp.
  - Langloisia setosissima
- Polygonaceae
  - Chorizanthe rigida
  - Eriogonum deflexum
  - E. inflatum
  - E. pusillum
  - E. thomasii
  - E. trichopes
  - E. spp.
- Resedaceae
  - Oligomeris linifolia
- Rutaceae
  - Thamnosona montana
- Salicaceae
  - Salix sp.
- Scrophulariaceae
  - Mimulus sp.
  - Mohavea confertiflora
- Solanaceae
  - Lycium andersonii
  - L. cooperi
  - Nicotiana trigonophylla
  - Physalis crassifolia
- Tamaricaceae
  - Tamarix chinensis
- Visaceae
  - Phoradendron californicum
- Zygophyllaceae
  - Larrea tridentata

- Monocotyledones
  - Agavaceae
    - Yucca schidigera*
  - Juncaceae
    - Juncus sp.
  - Poaceae (Gramineae)
    - Aristida sp.
    - Distichlis spicata
    - Erioneuron puchellum
    - Hilaria jamesii
    - Schismus arabicus
  - Typhaceae
    - Typha angustifolia or domingensis (?)

* Plant species listed in the 1976 Draft Supplement, but not observed in the 1977 survey.

(?) Species could not be absolutely identified because the plant specimen observed was either without flowers and/or foliage.

(Nomenclature follows Munz - A Flora of Southern California)

United States Department of the Interior
BUREAU OF RECLAMATION
LOWER COLORADO REGIONAL OFFICE
P.O. BOX 427
BOULDER CITY, NEVADA 89005

IN REPLY REFER TO: LC-230
S64.

APR 26 1977

Mr. Donald L. Paff, Administrator
Oivision of Colorado River Resources
P.O. Box 19090
Las Vegas, Nevada B9119

Oear Mr. Paff:

This is in response to your letter of March 1S which requested our comments on the Oraft Supplement to the Final Environmental Statement, Proposed Sale of Fort Mohave Lands, Nevada (INT FES 7S-10). The principal subjects covered by the Oraft Supplement are discussed below.

Flood Hazards

Information contained in Appendix B, Flood Hazard Evaluation for the Fort Mohave Lands, has been provided by the Corps of Engineers. Oata on sheet flow flooding (Zones B_6 and B_{12}) were developed by the Corps. Oata on mainstem flooding along the Colorado River provided by the Corps were based on Bureau of Reclamation data available in its files. This office is in agreement with the information provided by the Corps as shown in Appendix B. However, the text of the draft supplement near the bottom of page 4 states: "The Flood Hazards Map indicates that area within the flood plain (and within the land sale area) which would be inundated by a 100-year-frequency flood of the Colorado River, the peak flows during such an occurrence reaching as high as 74,000 cfs. The existing levee along the Colorado River is designed to pass S0,000 cfs, 24,000 cfs less than the 100-year flood maximum." The latter part of this statement beginning with "the peak flows. . ." is incorrect. The 100-year flood is no more than 50,000 ft^3/s, the magnitude of the levee-design flood, and it will be contained by the levee with an ample freeboard. Mainstem flooding due to a 100-year event will be confined to the areas identified on the Corps' map. In the upstream reach of the river, its spread is limited by topography and in the downstream reach, by the existing levee. A portion of the upstream area is not required for conveyance of floodflows and may be used for general development if suitable measures, such as filling of low areas, are employed to remove or reduce flood risks. This possibility is explained in greater detail in

our 1969 report, Flood Plain Information, Colorado River, Oavis Oam to Topock.

Endangered Species and Critical Habitat

The National Resources Oefense Council (NROC) raised the Section 7 issue (page 4B of the supplement). It alleged violation of Section 7 because the lands to be transferred provide habitat for the desert tortoise, spotted bat, Gila monster, Yuma clapper rail, brown pelican, bald eagle, prairie falcon, peregrine falcon, woundfin, Colorado River squawfish, humpback sucker, and longtail chub. All of the above were claimed to be endangered species. The Bureau of Land Management conducted a study and issued a compliance report (pages 24-2B of the supplement), which thoroughly demonstrates compliance with Section 7. First, only six of the species listed by NROC are actually listed. Of these, only the Yuma clapper rail could find even partially usable habitat in the subject lands and there are no documented sightings of rails there. There appears to be no actual violation of Section 7 since there is no habitat determined to be critical which will be adversely affected and there are no species which will be affected. BLM has consulted with the Fish and Wildlife Service and there may be enhancement for potential Yuma clapper rail habitat resulting from the proposed action.

Cultural Resources

The Environmental Oefense Fund raised the question of violation of Section 106 of the Historic Preservation Act - specifically of consultation with the Advisory Council on Historic Preservation concerning effects on properties eligible for the National Register of Historic Places.

The supplement documents a cultural resources inventory of the subject lands that the Nevada Archeological Survey conducted for BLM (see pages 30-46 of the supplement). The survey located no sites on the flood plain portion of the lands. There were both historic and prehistoric sites located on the terraces.

The Nevada Archeological Survey and BLM concluded that none of the sites are eligible for the National Register of Historic Places. As the inventory has been made, BLM has complied with legislation and regulations requiring that an agency determine

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whether National Register sites will be affected. They have concluded that no sites are in the affected area; therefore, the National Council on Historic Preservation does not need to be consulted. There is no violation of Section 106 as long as no sites are determined to be eligible for inclusion on the National Register of Historic Places.

We are providing the Bureau of Land Management a copy of this letter so that the information on flood hazards in the Draft Supplement to the Final Environmental Statement, Proposed Sale of Fort Mohave Lands, Nevada, may be corrected.

Sincerely,

Manuel Lopez, Jr.
Regional Director

cc:
State Director (N-911), Bureau of Land Management, Room 3008,
Federal Building, 300 Booth Street, Reno, Nevada 89509

029

National Wildlife Federation
1412 16TH ST., N.W., WASHINGTON, D.C. 20036
Phone: 202—797-6800

May 4, 1977

Honorable Cecil D. Andrus
Secretary of the Interior
Washington, D.C. 20240

Dear Mr. Secretary:

As you know, Section 102 of P.L.94-579, the Federal Land Policy and Management Act of 1976 makes it a matter of general national policy to retain public lands in federal ownership. Therefore, it is more important than ever to examine all proposals and plans that might result in the transfer or sale of any national resource land to nonfederal or private ownership.

That is why we are using this means to bring to your personal attention a plan to transfer to the State of Nevada some 9,000 acres of federal land in southern Nevada adjacent to the Colorado River. This plan, known as the Port Mohave Land Sale, is not a new one, dating back a good many years. In fact, the Port Mohave Act, P.L.86-433, addressing the larger transfer (sale) of approximately 15,000 acres was enacted in 1960 and subsequently amended in 1963. P.L.86-433 authorized the transfer of the Port Mohave parcel to the State of Nevada's Division of Colorado River Resources which apparently has plans for extensive residential and commercial development of the area.

In view of the later enactment of environmentally-enlightened laws such as the earlier-mentioned "BLM Organic Act," the National Environmental Policy Act, and the Endangered Species Act we wonder about the wisdom, perhaps even the legality, of the proposed transfer.

The Federation is aware that both a draft and a final environmental impact study have been filed on the proposal. Further, we recognize that Bureau of Land Management biologists, pursuant to provisions of the Endangered Species Act, have studied the Fort Mohave area and determined that the proposed transfer and subsequent commercial and residential development presumably will not impact adversely on any endangered species of wildlife but would reduce habitat and displace other wildlife. That determination is questioned, however, by some who believe that such development of the area might impact adversely on the endangered Yuma clapper rail. Also, the EIS points out that such development, emphasizing flat water recreation as it does, would have a significant impact on the recreation resource, i.e. the Colorado River. For one thing, commercial and residential development would require substantial allocations of Colorado River water, a resource already in short supply in Nevada and elsewhere.

029

There seem to be two main issues at stake: first, and most important, should the 9,000 acre Fort Mohave tract be transferred to the State of Nevada as authorized by the earlier statutes dating back to the 60's or should it remain in federal ownership pursuant to the national policy established by the Federal Land Policy and Management Act of 1976? And second, if it is determined that the land should be transferred to comply with the 1960 Act, would it not be in the greater interest of the public to transfer the tract to a state agency or state educational institution which would continue to administer the area undeveloped or developed only minimally for its recreational and other natural resource values? (That course of action, though less desirable in our judgment, would at least minimize the impact on the fragile desert biome.)

The National Wildlife Federation urges you to personally review the Fort Mohave proposal at an early date to ensure that the broader national interests are adequately protected in this matter.

Sincerely yours,

THOMAS L. KIMBALL
Executive Vice President

cc: Mike O'Callaghan, Governor, State of Nevada
Members, Nevada Congressional Delegation
Chairman, Senate Energy and Natural Resources Committee
Chairman, House Interior Committee
Ed Rowland, BLM Director, State of Nevada
Cliff Young, NWF Director
Bill Reavley, NWF Regional Executive
Hewitt Wells, Director, Nevada Wildlife Federation

030

Advisory Council on
Historic Preservation
1522 K Street N.W.
Washington, D.C. 20005

PROGRAM/
PROJECT # 56-77-00028
ACTIVITY
FILE 561 BLM

May 6, 1977

Deputy Assistant Secretary for Fish,
Wildlife and Parks
U.S. Department of the Interior
Room 314B
Washington, D.C. 20240

Dear Sir:

The Advisory Council on Historic Preservation has been informed by Ike C. Eastvold, Chairman, California Desert Archeology Committee, Society for California Archeology, that the proposed sale of Fort Mojave Lands, Clark County, Nevada, to the State of Nevada, an undertaking of the Bureau of Land Management, may have an effect upon numerous cultural resources in the area which may be eligible for inclusion in the National Register of Historic Places.

On the basis of this information, the Council requests that you investigate this matter to determine whether the nature of the effect requires BLM to obtain the comments of the Council in accordance with Section 106 of the National Historic Preservation Act (16 U.S.C. 470f, as amended, 90 Stat. 1320). Steps to determine this responsibility are set forth in Section 800.4 of the Council's "Procedures for the Protection of Historic and Cultural Properties" (36 C.F.R. Part 800).

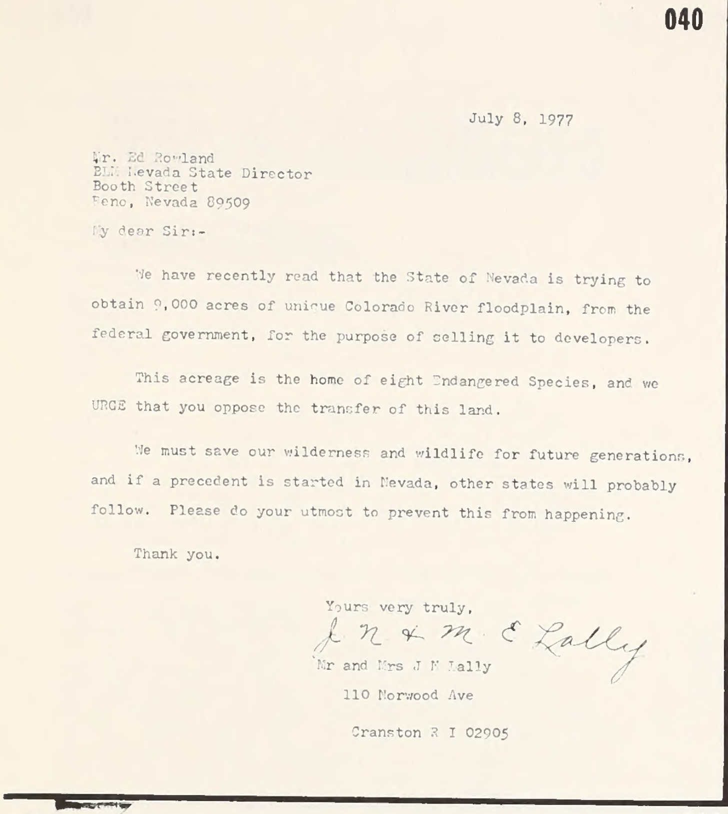
The Council requests that you report the results of your investigation to this office at the earliest opportunity. If you have further questions or require assistance regarding this matter, please contact Michael H. Bureman of the Council staff, at (303) 234-4946.

The Council appreciates your cooperation in this matter.

Sincerely yours,

Brit Allan Storey

for Louis S.
Assistant
Review a



040

July 8, 1977

Mr. Ed Rowland
BLM Nevada State Director
Booth Street
Reno, Nevada 89509

My dear Sir:-

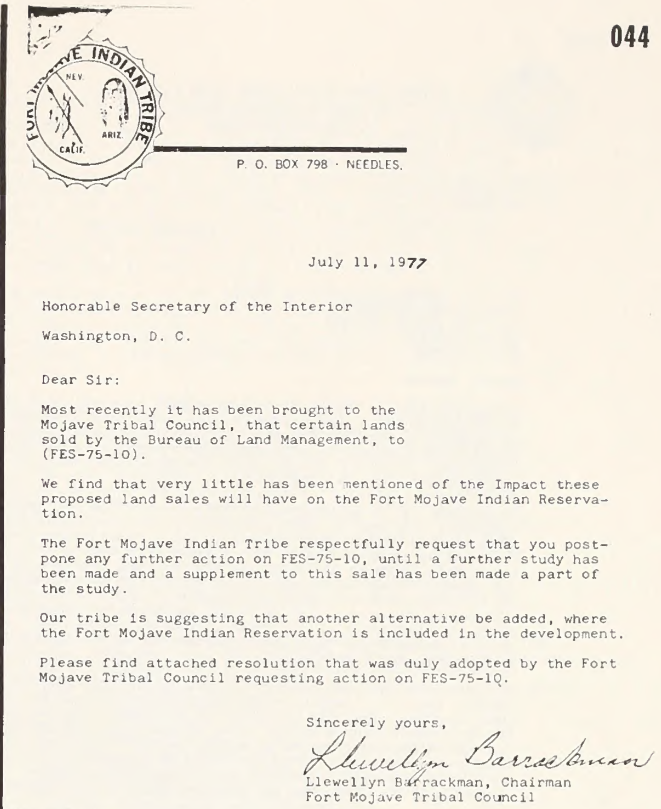
We have recently read that the State of Nevada is trying to obtain 9,000 acres of unique Colorado River floodplain, from the federal government, for the purpose of selling it to developers.

This acreage is the home of eight Endangered Species, and we URGE that you oppose the transfer of this land.

We must save our wilderness and wildlife for future generations, and if a precedent is started in Nevada, other states will probably follow. Please do your utmost to prevent this from happening.

Thank you.

Yours very truly,
J N & M E Lally
Mr and Mrs J N Lally
110 Norwood Ave
Cranston R I 02905



044

P. O. BOX 798 · NEEDLES,

July 11, 1977

Honorable Secretary of the Interior

Washington, D. C.

Dear Sir:

Most recently it has been brought to the Mojave Tribal Council, that certain lands sold by the Bureau of Land Management, to (FES-75-10).

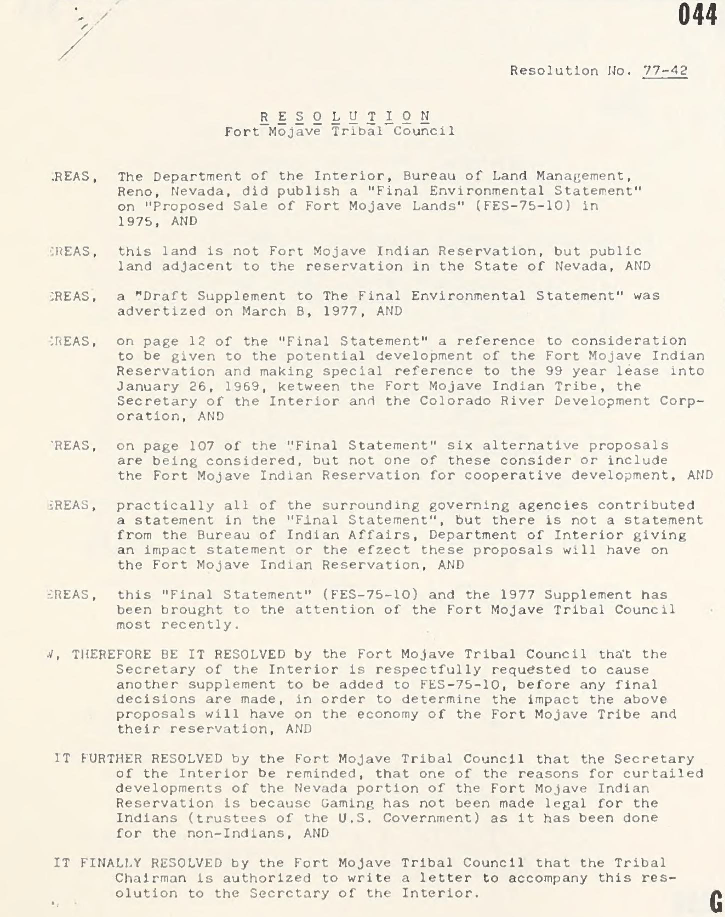
We find that very little has been mentioned of the Impact these proposed land sales will have on the Fort Mojave Indian Reservation.

The Fort Mojave Indian Tribe respectfully request that you postpone any further action on FES-75-10, until a further study has been made and a supplement to this sale has been made a part of the study.

Our tribe is suggesting that another alternative be added, where the Fort Mojave Indian Reservation is included in the development.

Please find attached resolution that was duly adopted by the Fort Mojave Tribal Council requesting action on FES-75-10.

Sincerely yours,
Llewellyn Barrackman
Llewellyn Barrackman, Chairman
Fort Mojave Tribal Council



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Resolution No. 77-42

RESOLUTION
Fort Mojave Tribal Council

REAS, The Department of the Interior, Bureau of Land Management, Reno, Nevada, did publish a "Final Environmental Statement" on "Proposed Sale of Fort Mojave Lands" (FES-75-10) in 1975, AND

EREAS, this land is not Fort Mojave Indian Reservation, but public land adjacent to the reservation in the State of Nevada, AND

EREAS, a "Draft Supplement to The Final Environmental Statement" was advertized on March 8, 1977, AND

EREAS, on page 12 of the "Final Statement" a reference to consideration to be given to the potential development of the Fort Mojave Indian Reservation and making special reference to the 99 year lease into January 26, 1969, between the Fort Mojave Indian Tribe, the Secretary of the Interior and the Colorado River Development Corporation, AND

REAS, on page 107 of the "Final Statement" six alternative proposals are being considered, but not one of these consider or include the Fort Mojave Indian Reservation for cooperative development, AND

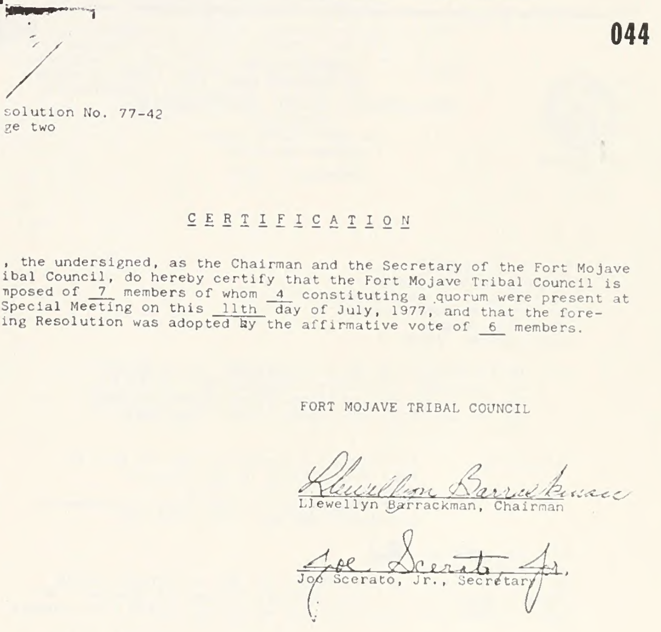
EREAS, practically all of the surrounding governing agencies contributed a statement in the "Final Statement", but there is not a statement from the Bureau of Indian Affairs, Department of Interior giving an impact statement or the efzect these proposals will have on the Fort Mojave Indian Reservation, AND

EREAS, this "Final Statement" (FES-75-10) and the 1977 Supplement has been brought to the attention of the Fort Mojave Tribal Council most recently.

W, THEREFORE BE IT RESOLVED by the Fort Mojave Tribal Council that the Secretary of the Interior is respectfully requested to cause another supplement to be added to FES-75-10, before any final decisions are made, in order to determine the impact the above proposals will have on the economy of the Fort Mojave Tribe and their reservation, AND

IT FURTHER RESOLVED by the Fort Mojave Tribal Council that the Secretary of the Interior be reminded, that one of the reasons for curtailed developments of the Nevada portion of the Fort Mojave Indian Reservation is because Gaming has not been made legal for the Indians (trustees of the U.S. Government) as it has been done for the non-Indians, AND

IT FINALLY RESOLVED by the Fort Mojave Tribal Council that the Tribal Chairman is authorized to write a letter to accompany this resolution to the Secretary of the Interior.



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solution No. 77-42
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CERTIFICATION

, the undersigned, as the Chairman and the Secretary of the Fort Mojave ibal Council, do hereby certify that the Fort Mojave Tribal Council is mposed of 7 members of whom 4 constituting a quorum were present at Special Meeting on this 11th day of July, 1977, and that the foreing Resolution was adopted by the affirmative vote of 6 members.

FORT MOJAVE TRIBAL COUNCIL

Llewellyn Barrackman
LLewellyn Barrackman, Chairman

Joe Scerato, Jr.
Joe Scerato, Jr., Secretary

045

United States Department of the Interior
BUREAU OF INDIAN AFFAIRS
COLORADO RIVER AGENCY
Route 1, Box 9-C
Parker, Arizona 85344

IN REPLY REFER TO:
Tribal Operations
(602) 669-2134

October 28, 1977

Mr. E. I. Rowland, State Director (N-911)
Bureau of Land Management
Room 3008, Federal Building
300 Booth Street
Reno, NV 89509

Dear Mr. Rowland:

We have been asked to comment on the Environmental Statement, FES-75-10, for the sale of Fort Mojave (non-Indian) lands to the State of Nevada and to assist in gathering information for a socio-economic study of the Fort Mojave Indian Tribe whose reservation is adjacent to the lands in question. We are vitally interested in the impact this proposed sale might have on the reservation.

We are aware that in the Statement, the only mention of the Fort Mojave reservation is on pages 12 and 18, referring to a 99-year lease held by the Colorado River Development Corporation. It is indeed strange that no comment was solicited from the Bureau of Indian Affairs, nor from the tribal lessee, prior to publishing FES-75-10. Colorado River Development Corporation has changed ownership and the new owners are pursuing the development of the recreational-commercial potential, similar to what is displayed on page 13 of the report, and are in the process of developing a modified plan. The Tribal Chairman has requested the Bureau of Indian Affairs to develop a plan covering certain portions of the land area covered by FES-75-10.

We understand a socio-economic report on this proposed land sale will be completed soon. It is hard to believe that such a report would be finalized without input from the Tribe. The development of Lake Havasu City in Arizona is a prime example of how a city was developed adjacent to a reservation, adding no visible benefits to the Indians except a few conveniences. With some coordinated efforts, the Chemehuevis, through their recreation-oriented enterprise, could be complimented by Lake Havasu City in the future, thus increasing employment on the reservation.

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With the above points in mind, I respectfully request that more time be given to the Fort Mojave Indian Tribe and to their affected lessee in order for them to prepare statements reflecting the impact of the proposed land sale and to prepare alternative measures to the plan.

Sincerely yours,

Acting Superintendent

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STATE OF NEVADA
DIVISION OF
COLORADO RIVER RESOURCES
P.O. Box 19090
LAS VEGAS, NEVADA 89119
TELEPHONE (702) 733-7755

KE O'CALLAGHAN
GOVERNOR

January 6, 1978

Mr. E. I. Rowland
State Director, Nevada
U. S. Bureau of Land Management
Room 3008 Federal Building
300 Booth Street
Reno, Nevada 89502

Re: Preliminary Final Draft Supplement to the Final Environmental Statement, Proposed Sale of Fort Mohave Lands, Nevada (Prepared by Bureau of Land Management (1972 Fort Mohave Final Supplement N-921, 12-12-77)

References:
1. Environmental Statement for the Sale of Fort Mohave Lands to the State of Nevada (FES 75-10, 1-23-75)
2. Draft Supplement to the Final Environmental Statement (INT FES 75-10, 4-8-77)

Dear Mr. ~~Rowland~~: Ed

We wish to thank you for sending us the two copies of the subject supplement for our informal review and comment. We have reviewed the supplement and we attach hereto our comments.

The format which is used for our comments will follow the format of the preliminary final draft supplement so that you may follow our comments more readily.

Sincerely,

Don

Donald L. Paff
Administrator

Attachment

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GENERAL COMMENT
on

Preliminary Final Draft Supplement to the Final Environmental Statement for the Proposed Sale of Fort Mohave Lands, Nevada, Prepared by the Bureau of Land Management (Undated).

1. Vegetation: Endangered or Threatened Species

Because of the statements that, "No species has been officially listed as threatened," and, "The field, literature, and herbaria investigations did not show any of these species occurring in the proposed sale area," this portion needs no comment.

2. Wildlife: Endangered or Threatened Species

The preliminary final draft contains the following language: "Habitat for the bald eagle, peregrine falcon, brown pelican, Colorado River squawfish, and the woundfin does not occur on or adjacent to the Fort Mohave land sale area. An existing 7.2 acres of possible Yuma clapper rail habitat exists within the land sale area. No evidence of this species presence was found during visual observation in March 1976, or during an intensive call count survey conducted during the nesting season of 1976. These cattail areas (7.2 acres) were found to be essentially dry during the period when the survey was conducted, and will soon be lost irrespective of, and unrelated to, the proposed action."

Such wording makes it quite obvious that there is no environmental impact pertaining to wildlife in the proposed land sale area and therefore no comment is necessary.

3. Flood Hazards

Flood hazards should have no effect on the sale of the Fort Mohave lands to the State of Nevada because of the following language contained in the Environmental Statement and the Supplement thereto: "The existing levee along the Colorado River is designed to contain 50,000 cfs, and therefore is capable of handling water flows from a predicted 100-year-flood. Water flows from a predicted Standard Project Flood (300 to 500 year occurrence) could overflow the existing westernmost levee."

Any plan of development for the floodplain area such as contained in Alternative A or Alternative B or modifications thereto would of necessity require evaluation and actions so that adequate protection provisions could be made for any kind of development. In the alternate the use of land subject to flooding could be of a type to accommodate intermittent flooding without substantial damage; i.e., recreational area absent structures. For these reasons it would appear that the development or non-development of the area, especially as pertains to flood hazards, could be adequately planned and controlled and therefore would not constitute a problem.

4. Archaeology (Cultural Resources)

The preliminary final draft contains the following language: "No archaeological sites or isolated finds were located in the Colorado River floodplain, however, there is the remote possibility of subsurface cultural resources being found during the development of the area. Development could disturb or destroy a number of the located sites on the alluvial fan and river terrace." However, 48 historic or prehistoric sites on public lands have been inventoried and recorded.

In the light of the language contained on Page 11 of the Preliminary Final Draft, which in effect states that anyone developing this area could be in constant touch with the Nevada Archaeological Survey and/or the Nevada Historic Society, through such eminent recognized specialists such as Dr. Richard Brooks of UNLV (NAS) and Dr. Ralph Roske of UNLV (NHS), the provisions contained in the Environmental Statement and its Supplements indicate no adverse effect from the sale of the lands to the State of Nevada and their subsequent planned development.

5. Social-Economic Conditions Related to the Fort Mojave Indians

The provisions contained in the Supplement are so nebulous and speculative as to impose no identifiable impact whatsoever on a proposed transfer of the area lands to the State of Nevada. The Fort Mojave tribe has entered into a 99-year lease with the Colorado River Development Corporation (CRDC), a private profit making corporation, and has thereby given up any input that it may have had previous thereto to any decisions made concerning the area lands. A Master Plan (submitted after passage of PL 86-433) for the development of the northern portion of the Reservation is contained in Map No. 6 on Page 18 of the Environmental Statement. This plan was submitted (and evidently approved) without any consultation with the State of Nevada as to the development of the land which the Congress had decided to transfer to the State of Nevada. It would be impossible, impractical, and unreasonable to even suggest that any prospective development of this area should be tied in with the development of the Indian reservation which development is presently unknown, illusive, and perhaps unrealistic.

No such restrictions were placed on the acquisition of the land by the State of Nevada at the time of the action of the Congress, and no such restrictions should be placed upon the acquisition of the lands when they are acquired as a result of the Federal legislation. To tie the development of the State of Nevada lands with the development of the Reservation lands, especially those owned by a private profit making corporation, would be to deprive the State of Nevada of its sovereign rights as well as make the State of Nevada dependent upon the decisions of corporate or private individuals. An approach of this kind is unwarranted, if not contrary to law.

Should a portion of the lands in question be sold for private development, a tie in to any other development in the area would be a logical and financial natural course of action and need not be specified as a condition precedent to the acquisition of the lands by the State of Nevada.

In addition, the Preliminary Final Draft on Page 10 assessed the Social and Economic Impacts on the Indian tribe taking into consideration Alternative B which is presently a non-existent proposal. Further, the CRDC has indicated it may scrap its plan to develop a resort-residential community. In the light of these two statements, it would serve no purpose to identify any coordination and/or cooperation between prospective developers of the land in question and the land in the Indian Reservation. The development of this area is in the future and to put such stipulations upon the sale of this land to the State of Nevada at the present time would be to deprive the State of Nevada of the intentions shown by the Congress in enacting the legislation by which the State of Nevada may acquire this land.

In the light of the above-mentioned comments and findings in the Environmental Statement and the Preliminary Final Draft Supplement, the proposed imposition of terms, conditions and stipulations as contained in the "Possible Mitigating and Enhancement Measures" are in the most part unrealistic.

a. To set aside areas of 20 acres or more as an area for Yuma clapper rail where all investigations indicate "no evidence of the presence of this species" and that possible areas are dry and will be lost irrespective of the proposed sale of the lands is unrealistic and inappropriate.

b. Flood management will be observed as a natural consequence of land development and there is no precedent known that the standards to be met are those by which federal flood insurance is alone the measuring criteria.

c. The main historic site, the Old Government Road, which is the subject of studies and concern in both California and Arizona, when investigated, showed that no physical evidence remained in the study area. A cemetery was shown to be on private land. Other historic sites have already been inventoried and recorded. We would have no objection to a provision such as suggested that should any other sites be discovered accidentally in developing the subject lands, such findings could be reported to the State Historic Preservation Officer.

d. There could be no possibility of any private or public development if development was made contingent in any way on the direction wishes of a private profit making corporation which would no doubt object to any competitive development of the adjacent area. In the light of all the undocumented disclosures contained in the studies, the vast amount of unknown quantities such as the question of gaming on reservation lands, the alleged modifications of CRDC plans, etc., and the fact that Congressional action (PL86-433) was enacted before the CRDC lease, the State of Nevada should not be made subservient in any manner to that company. Such a restriction should be entirely deleted or even mentioned as part of the social economic conditions.

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(June 1984)

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